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FLOOD INSURANCE STUDY

TOWN OF DERRY, NEW HAMPSHIRE
ROCKINGHAM COUNTY

7578452
7/13/81

APRIL 15, 1980

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 330128

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Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the Town of Derry, Rockingham County, New Hampshire, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Derry to the regular program of flood insurance by the Federal Insurance Administration. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

Streams requiring detailed study were selected at a meeting held in March 1976. It was attended by representatives of the Federal Insurance Administration, the study contractor, and the Town of Derry.

During the course of the study, specific information on peak discharge-frequency relationships, flood control projects, previous flood hazard evaluations, recent and impending flood plain development, and the extent of historical flooding was obtained, reviewed, and discussed with various community officials, residents, and the New Hampshire Water Resources Board.

The results of this study were reviewed at a final community coordination meeting held on February 13, 1979. Attending the meeting were representatives of the Federal Insurance Admininstration, the study contractor, and the town. This study incorporates all appropriate comments, and all problems have been resolved. No problems were raised at the meeting.

1.3 Authority and Acknowledgments

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Anderson-Nichols and Company, Inc., for the Federal Insurance Administration, under Contract No. H-3989. This work, which was completed in March 1978, covered all significant flooding sources affecting the Town of Derry.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated areas of the Town of Derry, Rockingham County, New Hampshire. The area of study is shown on the Vicinity Map (Figure 1).

Flooding caused by the overflow of Beaver Brook, Hornes Brook, Shields Brook, Cunningham Brook, Drew Brook, Taylor Brook, two unnamed tributaries of Beaver Brook (referred to as Tributary O and Tributary G), two unnamed tributaries of Beaver Lake (referred to as Tributary E and Tributary F), and an unnamed tributary of Drew Brook (referred to as Tributary H) was studied in detail. Beaver Brook was studied from the Derry-Londonderry corporate limits to the outlet of Beaver Lake. Hornes Brook was studied from its mouth to Hornes Pond. Shields Brook was studied from Hornes Pond to Lower Shields Pond. Cunningham Brook was studied from Drew Brook to Hampstead Road. Drew Brook was studied from its mouth at Island Pond to the confluence of Leavitt and Cunningham Brooks, Taylor Brook (including Ballard Pond) was studied from its mouth at Island Pond to 600 feet upstream of its third crossing of Island Pond Road above Ballard Pond. Tributary O was studied from its mouth at Beaver Brook to the Derry-Londonderry corporate limits. Tributary G was studied from its mouth at Beaver Brook to its second crossing of Windham Road. Tributary E was studied from its mouth at Beaver Lake to Tsienneto Road. Tributary F was studied from its mouth at Beaver Lake up to and including Adams Pond. Tributary H was studied from its mouth to 600 feet upstream of Hampstead Road.

Those portions of the shoreline of Island Pond within the Derry corporate limits and the complete shorelines of Beaver Lake, Lower Beaver Lake, and Adams Pond were also studied in detail.

Those areas studied by detailed methods were chosen with consideration given to all proposed construction and forecasted development through 1983.

At the March 1976 meeting, representatives of the study contractor met with community officials and the Federal Insurance Administration to determine the study areas.

Areas that were not studied are those areas where there are no important existing structures and where no structures are likely to be built in the foreseeable future.

Pertinent reports were reviewed, and residents of Derry helped to supply information on problem areas from previous floods. Also considered in providing limits of detailed study were top widths of the 100-year flood plain of less than 200 feet and drainage areas of streams of less than 1 square mile.

AUBURN

CHESTER

SANDOWN

LONDONDERRY

DERRY

HAMPSTEAD

WINDHAM

SALEM

APPROXIMATE SCALE

0 1 2 3 MILES

VICINITY MAP

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FIGURE 1

Although originally selected for detailed study, Flatrock Brook, West Running Brook, and Tributary I were studied by approximate methods because they did not meet Federal Insurance Administration detailed study criteria for top width limits and/or size of drainage area.

Several minor streams and ponds were studied by approximate methods.

In general, approximate methods of study were applied on streams having flood plains with top widths greater than 200 feet and drainage areas greater than 1 square mile.

Flood hazard determinations are based on existing hydrologic and hydraulic conditions at the time this report was prepared. No new flood control structures in the Town of Derry have been proposed and therefore, are not a required consideration in this analysis.

2.2 Community Description

The Town of Derry, a rural community with an area of approximately 35.6 square miles, is located in southwestern Rockingham County, in southern New Hampshire. It is approximately 10 miles southeast of Manchester and 11 miles northeast of Nashua, New Hampshire.

Derry is bordered by Chester and Auburn to the north; Sandown, Hampstead, and Atkinson to the east; Windham and Salem to the south; and Londonderry to the west.

In 1976, the population was 16,861, giving a population density of approximately 474 persons per square mile. Data from the 1970 census indicates that the population increased by 5149 from 1970 to 1976, or approximately 44 percent (References 1,2, and 3).

Derry is a residential satellite community of the Cities of Manchester and Nashua, New Hampshire, and Boston, Massachusetts. The economy of Derry is supported by commerce, light industry, and agriculture. The construction of Interstate Highway 93 through the town has made it attractive to residential development, and it is expected to continue the rapid growth it has experienced in the last decade.

The climate of Derry is typical of southern New Hampshire, with warm summers and cool winters. Average temperatures in July range from a high of 84°F to a low of 57°F. Average temperatures in January range from a high of 36°F to a low of 14°F. Prolonged periods of severe cold are rare. Average annual precipitation is 42 inches, of which approximately 16 percent is in the form of snow (Reference 4).

The principal watercourses in the Town of Derry are Beaver Brook and Hornes Brook. Beaver Brook originates at the outlet of Beaver Lake and flows in a southwesterly direction for 4 miles before entering the Town of Londonderry. It then continues in a southerly direction

through Windham, Hudson, and Pelham, New Hampshire, and Dracut, Massachusetts, before emptying into the Merrimack River. Tributaries O and G flow into Beaver Brook.

Hornes Brook originates at Hornes Pond in Derry and flows in a southerly direction before emptying into Beaver Brook.

The Beaver Brook flood plain ranges in width from 20 to 2900 feet through the study area. This flood plain is primarily open or wooded with minor residential and commercial development.

The Hornes Brook flood plain ranges in width from 20 to 350 feet through the study area. This flood plain consists of residential and commercial development.

The flood plains of the remaining streams studied by detailed methods average 350 feet in width. They are wooded and contain sparse residential development.

The Town of Derry lies in the seaboard lowland section of the New England province and is characterized by stratified and unstratified material deposited by a receding glacial ice sheet. Because of the glacial nature of the landscape, irregular slopes, coarse soils, occasional outcrops of bedrock, and boulders are common. The predominant soil group in Derry is coarse-grained sandy loams formed from glacial till or glacial outwash deposits. Extensive areas of fine-grained and highly organic soils are scattered throughout the town. These are very acid soils which are associated with swamps and wetlands. Depositional features associated with deglaciation of this area include stratified gravel, sand, and silt deposits in kames; kame deltas; valley trains; crevasse fillings; and small outwash plains. Scattered throughout the town are wet swampy areas and kettle-hole ponds that serve as the headwaters for many of the study streams. The drainage pattern of the streams in Derry is typical of glaciated terrain where resumption of the normal drainage has not yet occurred. These swamps and ponds provide large amounts of natural storage and, thus, reduce peak discharges (Reference 5).

Elevations in the town range from approximately 190 feet near Island Pond to approximately 600 feet at the summit of Warner Hill, the highest point in town.

Vegetative cover is found mainly in wooded areas; however, much of the area is devoted to pastures and tilled fields. The tree stands are comprised of broadleaf species of northern red oak, red maple, and gray birch interspersed with coniferous species of white pine and hemlock. Witch hazel and sweetfern are also common in the wooded area. Mountain laurel predominates in many upland pastures (Reference 5).

2.3 Principal Flood Problems

Major floods occur during the spring, fall, and winter seasons. Some of the most severe flooding occurs in early spring as a result of snowmelt and heavy rains in conjunction with ice jams. Fall is another critical season for flood danger because of heavy rainfall and the possibility of tropical storms; however, flooding incidents in Derry can occur at any time of the year. Scenes of past floods in the Town of Derry are shown in Figures 2 and 3.

Damage to structures in the flood plains has occurred in 1901, 1936, 1938, and 1977, with the 1936 flood being the largest flood of record.

2.4 Flood Protection Measures

No flood protection structures exist on any of the detailed study streams within the town, and no plans have been disclosed for the implementation of any future flood protection measures.

The Town of Derry has no formal flood fighting or emergency evacuation plans. The town's police and fire departments and Civil Defense office are responsible for alerting residents of impending disasters and coordinating any emergency operations with town and state public services agencies.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual occurrence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

Figure 2. Flooding on Highland Street From Beaver Brook, March 14, 1977

Figure 3. Flooding on Florence Street From Hornes Brook, March 14, 1977

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each stream studied in detail in the community.

The principal source of data for defining discharge-frequency relationships for all streams, with the exception of Hornes and Shields Brooks, was the regional discharge-frequency equations developed by the U.S. Geological Survey (Reference 6). These regional equations relate topographical and precipitation characteristics to streamflow. Due to the extensive upstream channel and pond storage and flatter slopes, discharges for the Hornes Brook-Shields Brook watershed were derived using a regional discharge-frequency equation based on streams with similar characteristics (Reference 7).

Discharges for Beaver Brook were modified due to the storage effects of Beaver Lake. A reservoir routing using a numerical iteration method (Reference 8) was performed on Beaver Lake. The results of this routing were used to adjust the discharges of Beaver Brook and to establish the water-surface elevations of Beaver Lake for the 10-, 50-, 100-, and 500-year floods.

Similarly, discharges for Taylor Brook were modified due to the storage effects of Ballard Pond. The results of the reservoir routing performed on Ballard Pond were used to adjust the discharges of Taylor Brook and to establish the water-surface elevations of Ballard Pond for the 10-, 50-, 100-, and 500-year floods.

This reservoir routing method was also performed on Island Pond and the results were used to establish water-surface elevations of Island Pond for the 10-, 50-, 100-, and 500-year floods.

Peak discharge-drainage area relationships for Beaver, Shields, and Hornes Brooks; Tributaries 0, E, F, and G; Drew and Taylor Brooks; Tributary H; and Cunningham Brook are shown in Table 1.

Elevations for floods of the selected recurrence intervals on Adams Pond, Beaver Lake, Lower Beaver Lake, Island Pond, Lower Ballard Pond, and Upper Ballard Pond are shown in Table 2.

Table 1. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Beaver Brook					
From Upstream of Tributary A in Londonderry to Downstream of Tributary O in Derry[1]	32.7[2]	800	1660	2050	3500
From Upstream of Tributary O to Downstream of Hornes Brook[1]	24.3[2]	750	1520	1860	3300
From Upstream of Hornes Brook to Downstream of Tributary G[1]	17.5[2]	400	1150	1440	2880
From Upstream of Tributary G to Downstream of Tributary B	12.5[2]	130	510	650	1410
From Upstream of Tributary B to 650 Feet Downstream of Outlet of Beaver Lake[1]	12.0[2]	65	380	430	960
At Outlet of Beaver Lake	11.2	32	240	320	730
Shields Brook					
From Hornes Pond to First Crossing (Looking Upstream) of Derry-Londonderry Corporate Limits[1]	6.7[2]	260	313	368	500
From First Crossing (Looking Upstream) of Derry-Londonderry Corporate Limits to Second Crossing (Looking Upstream) of Derry-Londonderry Corporate Limits[1]	5.2[2]	146	234	276	362
From Second Crossing (Looking Upstream) of Derry-Londonderry Corporate Limits to Upstream Study Limit[1]	2.2[2]	84	127	146	200
Hornes Brook					
From Beaver Brook to Hornes Pond[1]	6.8[2]	260	313	368	500

[1] Reach Discharge [2] Drainage Area at Downstream Limit of Reach

Table 1. Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Tributary O					
At Beaver Brook	1.7	75	205	255	535
At Derry-Londonderry Corporate Limits	1.5	70	200	245	520
Tributary E					
At Beaver Lake	1.4	110	310	385	820
At Tsienneto Road	1.3	105	295	365	760
Tributary F					
At Beaver Lake	7.2	250	590	725	1350
At Outlet to Adams Pond	6.0	195	475	585	1150
Tributary G					
At Confluence With Beaver Brook	3.6	245	625	770	1500
Downstream of Confluence With West Running Brook	3.5	210	540	660	1290
Upstream of Confluence With West Running Brook	2.1	180	495	610	1250
At Windham Road	1.3	120	335	410	900
Drew Brook					
From Island Pond to Confluence of Leavitt and Cunningham Brooks[1]	5.0[2]	115	285	350	700
Taylor Brook					
At Island Pond	5.3	75	365[3]	525[3]	1345[3]
At Outlet to Ballard Pond	4.6	10	200[3]	320[3]	960[3]
At Inlet to Ballard Pond	3.4	320	820	1005	2000
At Confluence With Tributary J	2.5	210	560	690	1400
Tributary H					
At Confluence With Drew Brook	1.4	110	305	375	795
1000 Feet Upstream of Hampstead Road	1.0	25	40	120	150

[1]Reach Discharge [2]Drainage Area at Downstream Limit of Reach
[3]Discharges Reduced Due to Ballard Pond Storage

Table 1. Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Cunningham Brook					
At Confluence With Leavitt and Drew Brooks	3.4	245	630	775	1540
At Confluence With Tributary H	2.0	145	390	480	1000
At Hampstead Road	1.1	75	215	260	560

Table 2. Summary of Elevations

Flooding Source and Location	Elevation (Feet) 10-Year	50-Year	100-Year	500-Year
Adams Pond				
At Derry	326.0	327.1	327.3	328.1
Beaver Lake				
At Derry	287.9	289.3	289.6	294.0
Lower Beaver Lake				
At Derry	287.9	288.9	289.2	290.0
Island Pond				
At Derry	205.5	206.4	206.8	208.2
Lower Ballard Pond				
At Derry	251.5	253.6	254.6	256.2
Upper Ballard Pond				
At Derry	253.7	255.5	258.4	259.2

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of streams in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each stream studied in the community.

Water-surface elevations of floods of the selected recurrence intervals were computed for all streams studied by detailed methods through use of the U.S. Army Corps of Engineers HEC-2 step-backwater computer program (Reference 9).

In those areas where the analysis indicated supercritical flow conditions, critical depth was assumed for the flood elevation because of the inherent instability of supercritical flow. This is an accepted engineering practice.

Valley portions of the cross section data for these streams were obtained photogrammetrically (Reference 10); below-water portions of the cross sections were obtained by field measurement (Reference 11). Bridge plans were utilized to obtain elevation data and structural geometry. All bridges for which plans were either unavailable or out-of-date were surveyed.

Cross sections for the backwater analyses of the detailed study streams were located at close intervals above and below bridges in order to compute the significant backwater effects of these structures in the developed areas. In long reaches between structures, appropriate valley cross sections were also used.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Flooding depths on approximate study streams were estimated for the 100-year flood using normal depth analysis at representative stream cross sections.

Starting water-surface elevations for Beaver Brook were obtained from the Londonderry Flood Insurance Study (Reference 12). The water-surface elevations for the intermediate reach of Shields Brook were also coordinated with the Town of Londonderry Flood Insurance Study although the starting water-surface elevations were determined by normal depth analysis. Starting water-surface elevations for Tributary E and Tributary F were obtained from the Beaver Lake flood elevations, and starting water-surface elevations for Drew Brook and Taylor Brook were obtained from Island Pond flood elevations. Starting water-surface elevations for Tributary H were obtained from the Drew Brook flood profile because these streams have concurrent flood peaks. For all other streams, starting water-surface elevations were determined by normal depth analysis.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Roughness coefficients (Manning's "n") were determined by field inspection at each structure and at representative locations between structures. Coefficients for Beaver Brook ranged from 0.040 to 0.045 for the channel and from 0.055 to 0.100 for the overbanks. For all other streams, coefficients ranged from 0.035 to 0.055 for the channel and from 0.065 to 1.000 for the overbanks.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in the study are shown on the maps.

The flood elevations, as shown on the profiles, are considered valid only if hydraulic structures, in general, remain unobstructed. Flood elevations in this region can be raised by ice jams or by the accumulation of uprooted trees, brush, and other debris at bridges. As both these occurrences are unpredictable, the hydraulic analyses for this study are based only on conditions of unobstructed flow.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage State and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4800, with a contour interval of 5 feet (Reference 10).

In cases where the 100- and 500-year flood boundaries are close together, only the 100-year flood boundary has been shown.

For areas studied by approximate methods, the boundary of the 100-year flood was delineated on U.S. Geological Survey topographic maps that were photographically enlarged to a scale of 1:12,000 (References 13, 14, and 15) or on topographic maps at scales of 1:4800 and 1:2400 (References 10 and 16 respectively). The delineation utilized an estimated depth of flooding referenced to contour crossings of the stream.

Approximate flood boundaries in some portions of the study area were also taken from the Federal Insurance Administration's Flood Hazard Boundary Map (Reference 17).

Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. As minimum standards, the Federal Insurance Administration limits such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced.

The floodways for this study were determined using Method 1, a general encroachment throughout the study reach, of the U.S. Army Corps of Engineers HEC-2 computer program (Reference 9). No encroachment was attempted for cross sections at bridges. Encroachment limits were based on equal-conveyance reduction which would produce a surcharge in water surface related to a corresponding maximum 1.0-foot surcharge in energy gradeline or water-surface elevation. Because of the effects of downstream encroachment on energy gradeline and water-surface elevations upstream, there may be numerous cross sections where minimal encroachment can be permitted without upstream energy grade line or water-surface elevation increases of more than 1.0 foot. This domino effect, therefore, imposes an additional constraint on flood plain encroachment.

The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 3).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood boundaries are close together, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 4.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Beaver Brook								
A	24.233	110	606	3.4	235.9	235.9	236.5	0.6
B	24.694	180	910	2.3	238.0	238.0	238.9	0.9
C	25.075	100	654	2.2	241.2	241.2	241.3	0.1
D	25.546	100	598	2.4	242.7	242.7	243.4	0.7
E	25.789	127	962	1.5	244.4	244.4	245.1	0.7
F	26.233	230	2276	0.6	248.0	248.0	248.9	0.9
G	26.648	300	2677	0.2	248.0	248.0	248.9	0.9
H	26.870	350	1801	0.2	248.0	248.0	248.9	0.9
I	27.244	80	437	1.0	248.1	248.1	248.9	0.8
J	27.580	24	55	7.8	253.6	253.6	253.8	0.2
K	27.652	32	112	3.8	263.7	263.7	263.9	0.2
L	27.838	30	59	7.3	282.0	282.0	282.1	0.1

[1]Miles Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOODWAY DATA

BEAVER BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Shields Brook								
A	1.149[1]	20	45	8.2	263.8	263.8	263.8	0.0
B	1.415[1]	16	96	3.8	276.3	276.3	276.3	0.0
C	2.170[1]	40	240	1.2	307.3	307.3	307.3	0.0
D	3.372[1]	20	123	1.2	352.7	352.7	353.3	0.6
E	4.953[1]	20	82	1.8	366.0	366.0	366.9	0.9
F	4.488[1]	15	95	1.5	379.2	379.2	379.2	0.0
Hornes Brook								
A	0.083[1]	18	91	4.0	241.0	239.4[2]	240.1[2]	0.7
B	0.347[1]	16	81	4.5	243.2	243.2	244.0	0.8
C	0.620[1]	18	84	4.4	250.6	250.6	251.3	0.7
D	0.758[1]	20	92	4.0	252.8	252.8	253.7	0.9
Tributary O								
A	0.019[1]	30	48	5.2	239.1	235.0[2]	235.3[2]	0.3
B	0.184[1]	35	104	2.4	239.1	237.9[2]	238.7[2]	0.8
Tributary E								
A	0.000[3]	28	162	2.3	289.6	289.6	290.6	1.0
B	0.184[3]	36	467	0.8	293.6	293.6	294.3	0.7
Tributary F								
A	0.169[4]	102	589	1.1	297.6	297.6	298.6	1.0
B	0.471[4]	311	1133	0.6	299.3	299.3	300.2	0.9
C	0.770[4]	59	226	2.9	303.5	303.5	304.5	1.0
D	1.064[4]	19	65	10.1	320.7	320.7	320.7	0.0

[1]Miles Above Beaver Brook [2]Elevation Computed Without Consideration of Backwater Effects From Beaver Brook [3]Miles Above Mouth [4]Miles Above Beaver Lake

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOODWAY DATA

SHIELDS BROOK-HORNES BROOK-TRIBUTARY O-TRIBUTARY E-TRIBUTARY F

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Tributary G								
A	0.395[1]	50	489	1.5	248.0	243.7[2]	244.7[2]	1.0
B	0.822[1]	18	532	1.0	265.4	265.4	265.8	0.4
C	1.181[1]	81	547	0.9	273.2	273.2	274.0	0.8
D	1.735[1]	16	567	0.9	281.9	281.9	282.8	0.9
Drew Brook								
A	0.100[3]	170	974	0.4	206.8	206.8	207.8	1.0
B	0.425[3]	140	854	0.4	207.6	207.6	208.0	0.4
C	0.705[3]	65	376	0.9	208.9	208.9	208.9	0.0
D	1.043[3]	40	165	2.1	209.2	209.2	209.4	0.2
E	1.800[3]	70	129	2.7	213.8	213.8	214.0	0.2
Taylor Brook (Including Ballard Pond)								
A	0.225[3]	30	110	3.9	207.0	207.0	207.8	0.8
B	0.933[3]	19	87	4.9	218.2	218.2	218.9	0.7
C	1.638[3]	20	58	7.3	238.5	238.5	238.9	0.4
D	2.950[3]	208	1085	0.8	258.4	258.4	259.4	1.0
E	3.153[3]	49	553	1.5	262.9	262.9	262.9	0.0

[1]Miles Above Beaver Brook [2]Elevation Computed Without Consideration of Backwater Effects From Beaver Brook [3]Miles Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOODWAY DATA

TRIBUTARY G-DREW BROOK-TAYLOR BROOK (INCLUDING BALLARD POND)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Tributary H								
A	0.235	26	52	4.8	216.9	216.9	217.3	0.4
B	0.503	10	60	4.2	226.1	226.1	226.4	0.3
C	0.810	14	30	8.4	245.1	245.1	245.3	0.2
D	1.030	13	33	7.6	263.6	263.6	264.1	0.5
E	1.156	17	40	6.3	277.3	277.3	277.6	0.3
Cunningham Brook								
A	0.155	31	149	2.5	218.9	218.9	218.9	0.0
B	0.514	24	55	6.7	251.6	251.6	252.1	0.5
C	1.040	276	833	0.4	296.0	296.0	297.0	1.0

[1]Miles Above Mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOODWAY DATA

TRIBUTARY H-CUNNINGHAM BROOK

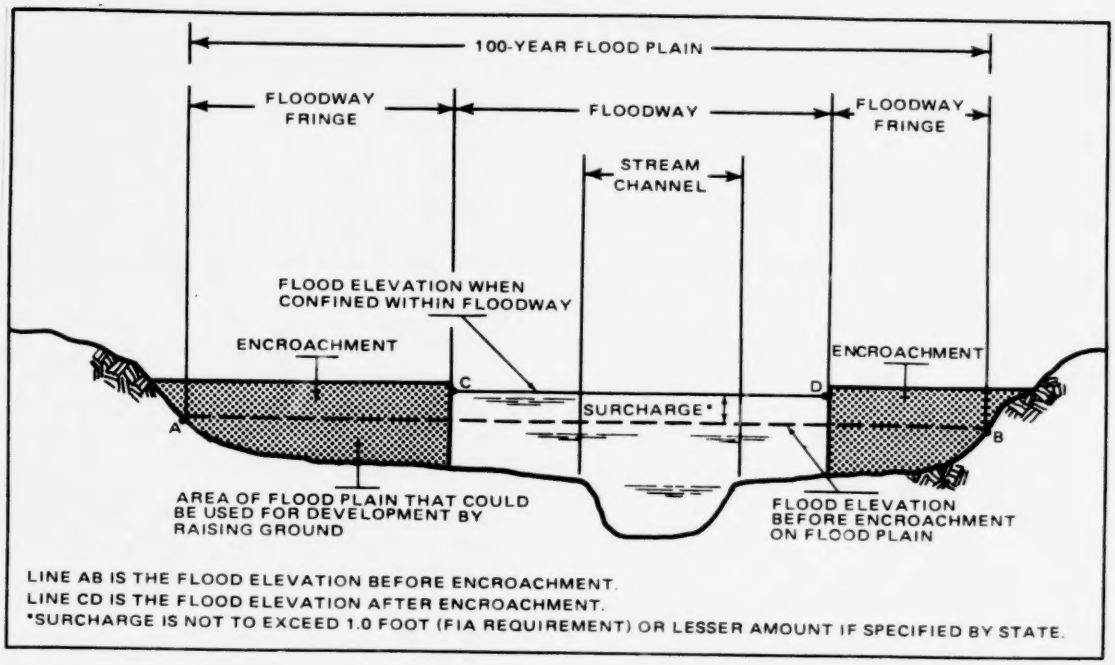

Figure 4. Floodway Schematic

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting the Town of Derry.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses and water bodies having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Twenty-seven reaches meeting the above criteria were required for the flooding sources of Derry. These included four on Tributary G; three each on Beaver, Shields, and Taylor Brooks, and Tributary H; two on Drew Brook; and one each on Hornes and Cunningham Brooks, Tributaries O, E, and F, Island and Adams Ponds, and Beaver and Lower Beaver Lakes. The locations of the reaches are shown on the Flood Profiles (Exhibit 1) and summarized in Table 4.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is the Federal Insurance Administration device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective Flood Hazard Factors, the entire incorporated area of the Town of Derry was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or Flood Hazard Factors determined.
Zones A1-A8 and A12:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to Flood Hazard Factors.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Beaver Brook							
Reach 1	0006,0009	-2.5	-0.7	2.0	025	A5	Varies - See Map
Reach 2	0006,0007	-6.0	-1.9	7.1	060	A12	Varies - See Map
Reach 3	0006,0007	-1.9	-0.3	2.4	020	A4	Varies - See Map
Shields Brook							
Reach 1	0003,0006	-0.9	-0.3	1.0	010	A2	Varies - See Map
Reach 2	0003	-2.8	-1.2	2.5	030	A6	Varies - See Map
Reach 3	0003	-0.6	-0.3	0.7	005	A1	Varies - See Map
Hornes Brook							
Reach 1	0006	-0.9	-0.3	1.0	010	A2	Varies - See Map
Tributary O							
Reach 1	0006	-1.1	-0.1	0.8	010	A2	Varies - See Map
Tributary E							
Reach 1	0004	-2.0	-0.2	1.9	020	A4	Varies - See Map
Tributary F							
Reach 1	0004	-1.7	-0.3	1.3	015	A3	Varies - See Map
Tributary G							
Reach 1	0006	-1.6	-0.3	1.5	015	A3	Varies - See Map
Reach 2	0006	-3.9	-0.3	1.1	040	A8	Varies - See Map
Reach 3	0006,0009	-1.2	-0.3	1.1	010	A2	Varies - See Map
Reach 4	0009	-1.8	-0.4	1.6	020	A4	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD INSURANCE ZONE DATA

BEAVER BROOK-SHIELDS BROOK-HORNES BROOK-TRIBUTARY O-TRIBUTARY E-TRIBUTARY F-TRIBUTARY G

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Drew Brook							
Reach 1	0008,0011	-1.5	-0.3	1.1	015	A3	Varies - See Map
Reach 2	0008	-2.2	-0.5	2.5	020	A4	Varies - See Map
Taylor Brook (Including Ballard Pond)							
Reach 1	0011	-1.4	-0.4	1.4	015	A3	Varies - See Map
Reach 2	0011	-3.1	-0.7	2.0	030	A6	Varies - See Map
Reach 3	0008,0010 0011	-3.7	-1.9	1.3	035	A7	Varies - See Map
Tributary H							
Reach 1	0008	-0.8	-0.3	0.6	010	A2	Varies - See Map
Reach 2	0008	-2.3	-0.8	1.2	025	A5	Varies - See Map
Reach 3	0005,0008	-1.1	-0.4	0.8	010	A2	Varies - See Map
Cunningham Brook							
Reach 1	0005,0008	-0.8	-0.2	0.7	010	A2	Varies - See Map
Adams Pond							
Reach 1	0004	-1.3	-0.2	0.8	015	A3	327
Beaver Lake							
Reach 1	0004	-1.7	-0.3	4.4	015	A3	290
Lower Beaver Lake							
Reach 1	0004,0007	-1.3	-0.3	0.8	015	A3	289
Island Pond							
Reach 1	0011	-1.3	-0.4	1.4	015	A3	207

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD INSURANCE ZONE DATA

DREW BROOK-TAYLOR BROOK(INCLUDING BALLARD POND)-TRIBUTARY H-CUNNINGHAM BROOK-ADAMS POND-BEAVER LAKE-LOWER BEAVER LAKE-ISLAND POND

Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

The flood elevation differences, Flood Hazard Factors, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 4.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Derry is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Insurance Administration.

6.0 OTHER STUDIES

Two Flood Insurance Studies for communities adjacent to Derry have been consulted in the preparation of this report. These were the Flood Insurance Studies for Londonderry and Windham (References 12 and 18). This study agrees with flood elevations and flood plain delineations determined by the Londonderry and Windham studies for areas in common with Derry.

The Federal Insurance Admininstration previously published a Flood Hazard Boundary Map for the Town of Derry (Reference 17). Due to a more detailed analysis, the present study is considered authoritative.

This study is authoritative for the purposes of the National Flood Insurance Program; data presented herein either supersede or are compatible with all previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the Insurance and Mitigation Division, Federal Emergency Management Agency, J.W. McCormack P.O. and Courthouse Building, Room 462, Boston, Massachusetts 02109.

8.0 BIBLIOGRAPHY AND REFERENCES

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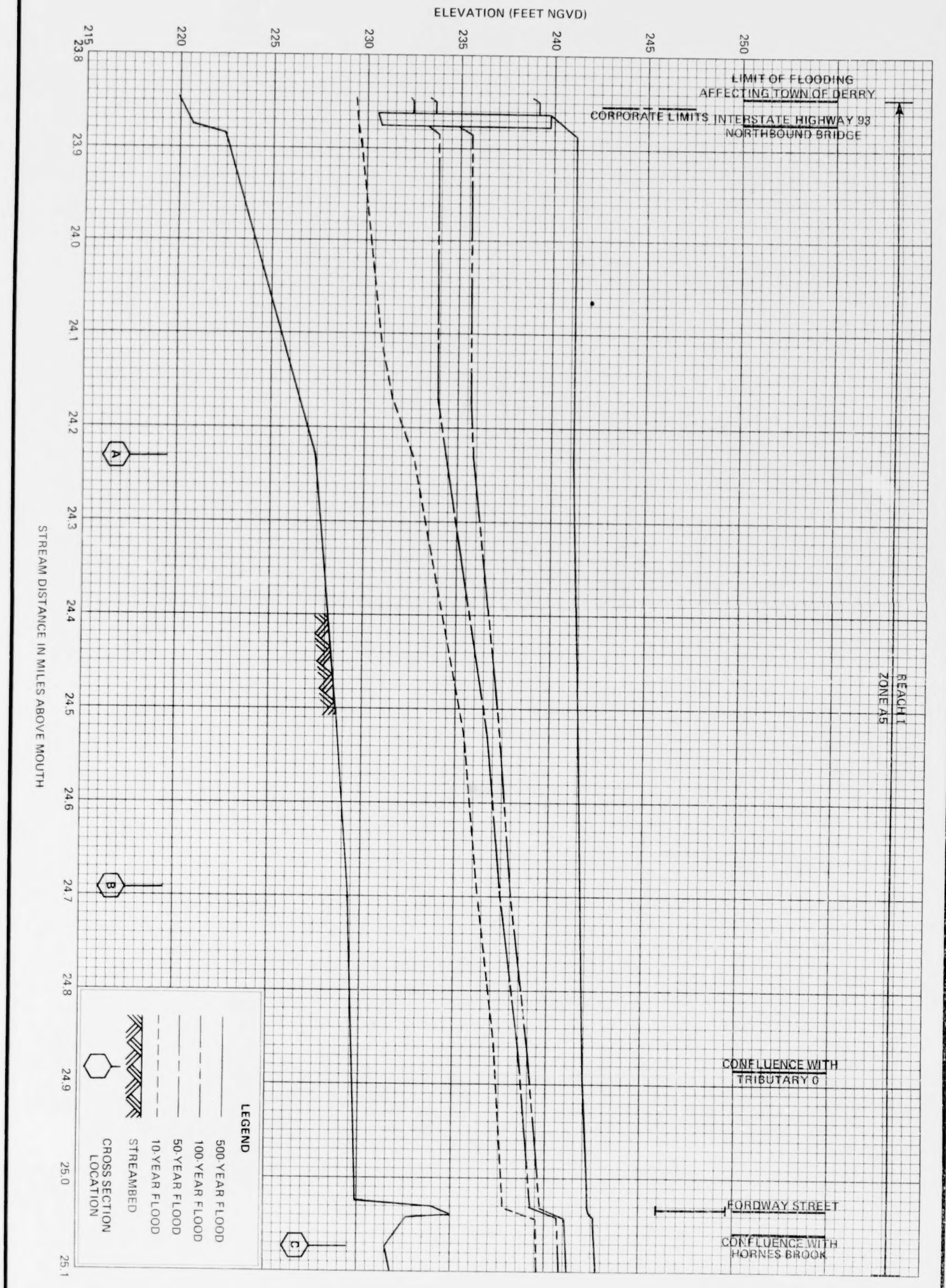


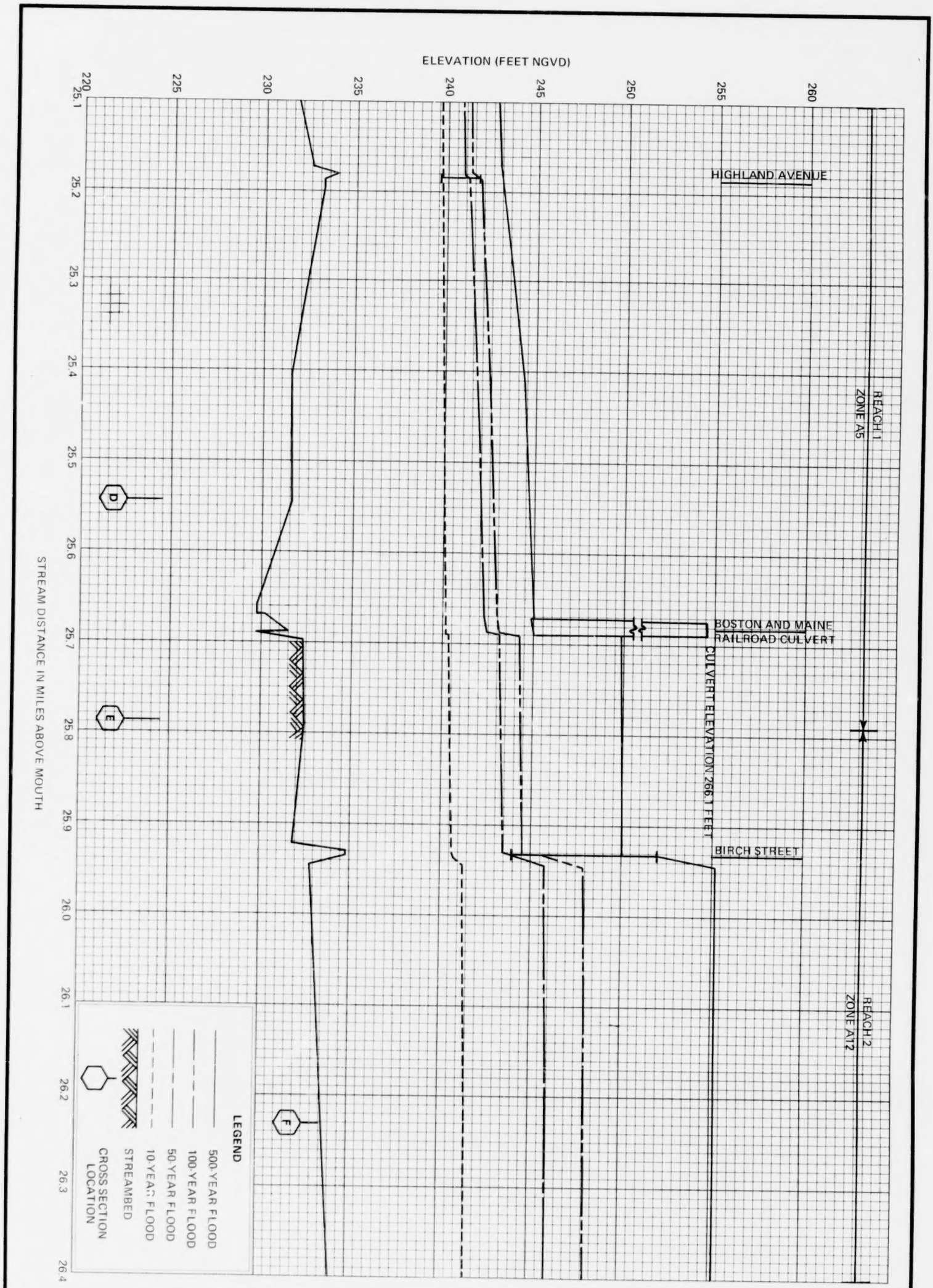
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK

01P



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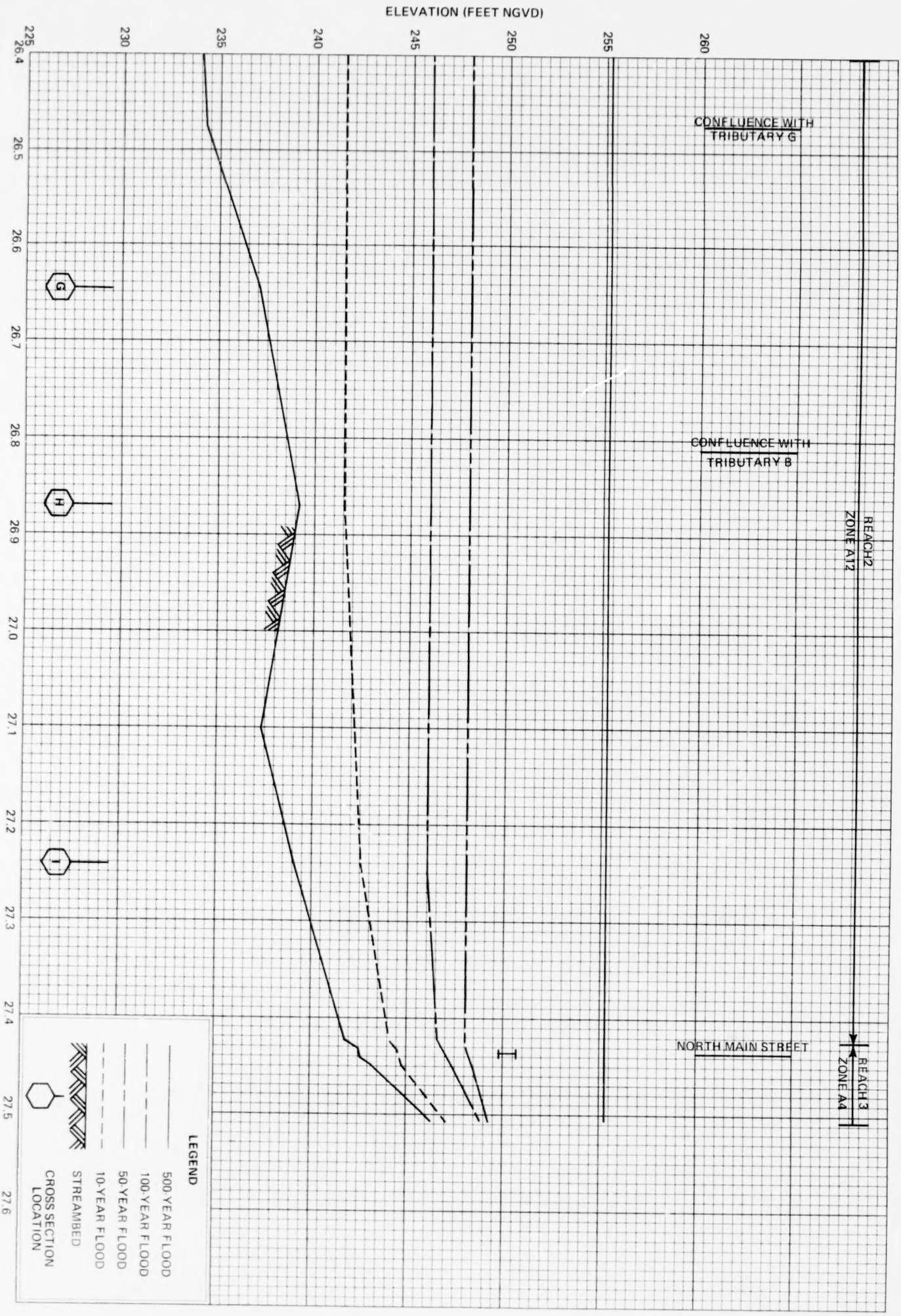
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK



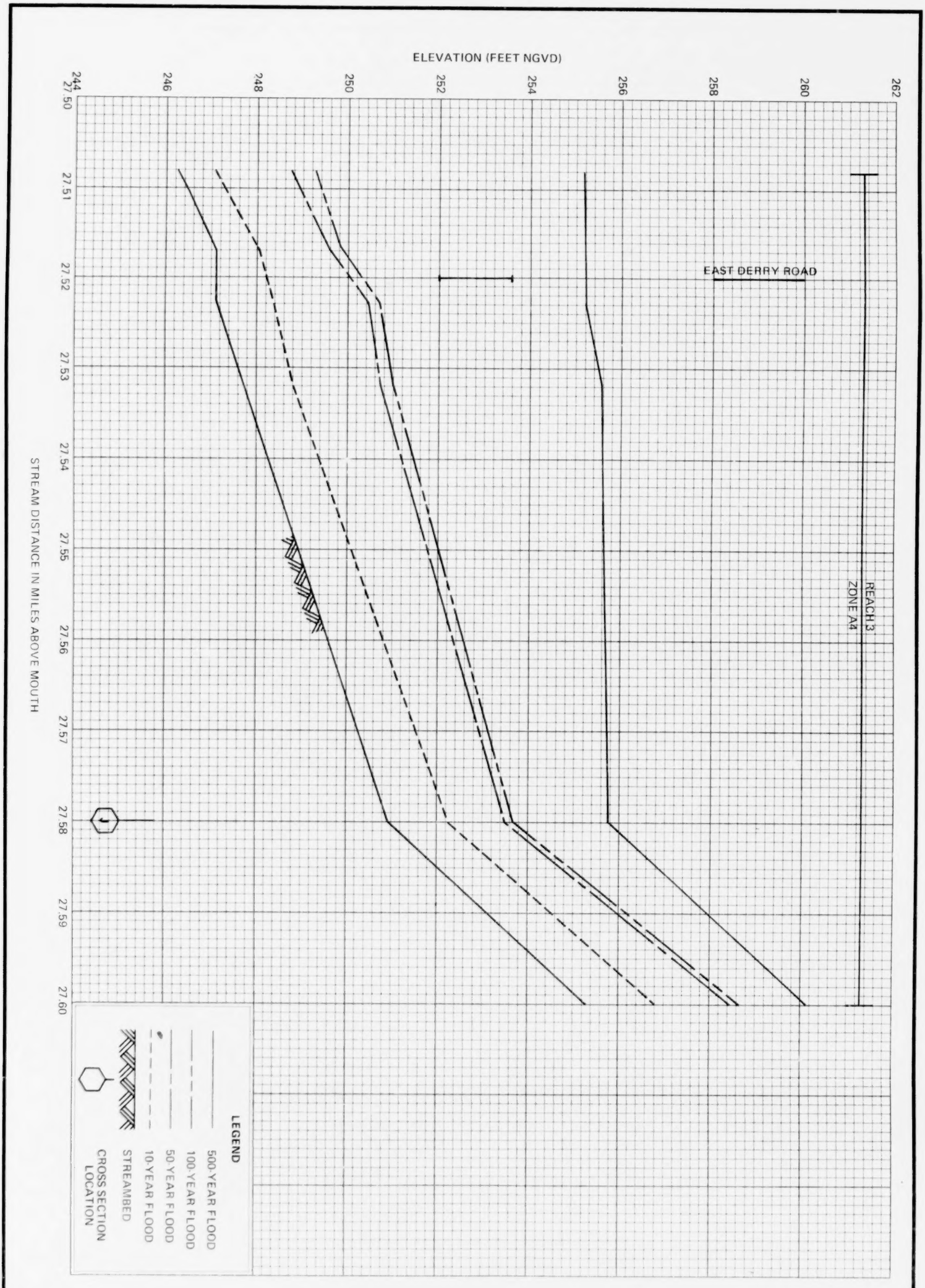
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK

03P



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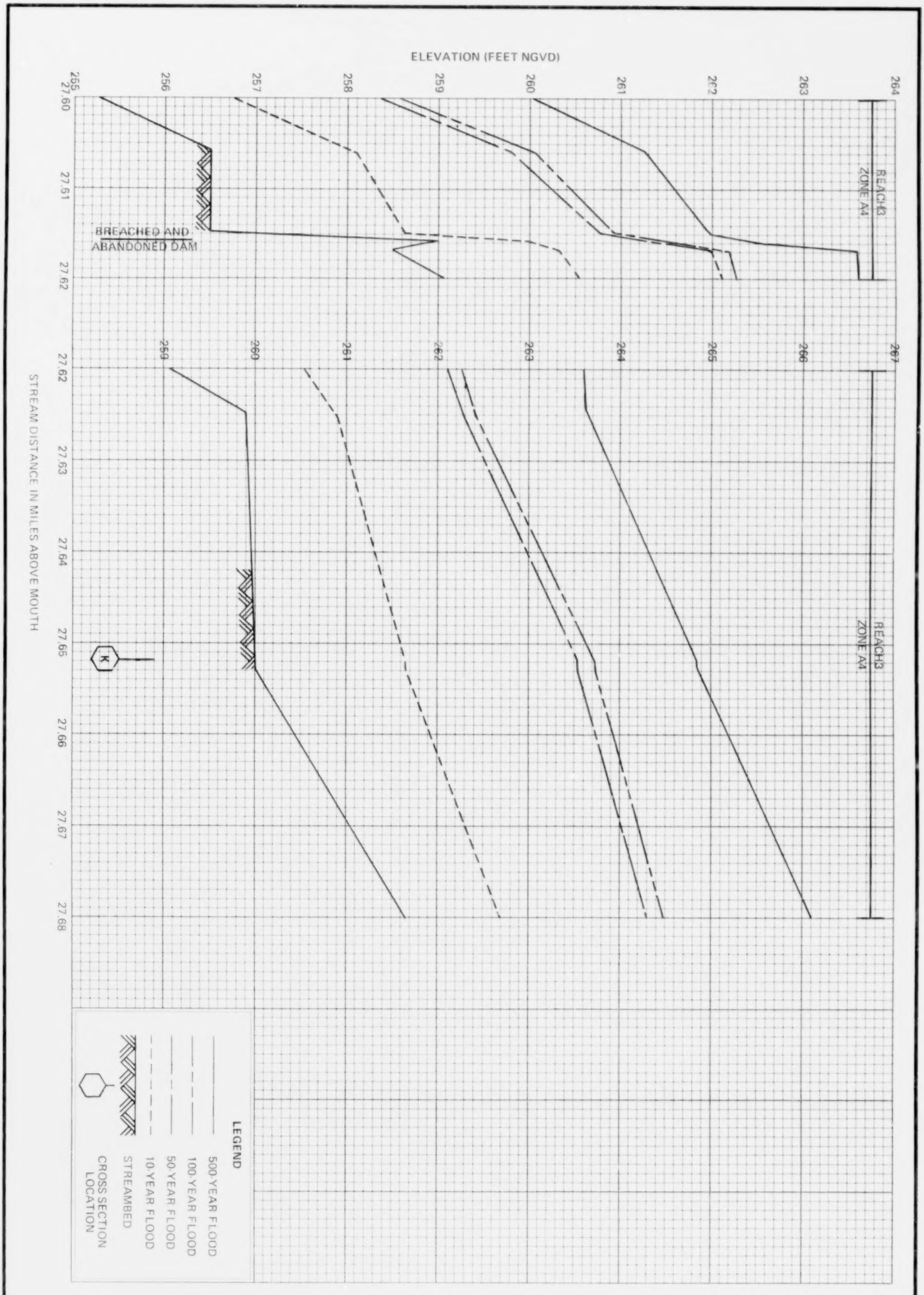
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK



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FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK

REACH 3
ZONE A4

REACH 3
ZONE A4

REACH 3
ZONE A4

MILL BUILDING ELEVATION 290

ELEVATION (FEET NGVD)

260
262
264
266
268
270
272
274
265
267
269
271
273
268
270
272
274
266
268
270
272
274
276

27.68
27.69
27.70
27.71
27.71
27.72
27.73
27.74
27.74
27.75
27.76
27.77

STREAM DISTANCE IN MILES ABOVE MOUTH

LEGEND

- 500-YEAR FLOOD
- 100-YEAR FLOOD
- 50-YEAR FLOOD
- 10-YEAR FLOOD
- STREAMBED
- CROSS SECTION LOCATION

FLOOD PROFILES

BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

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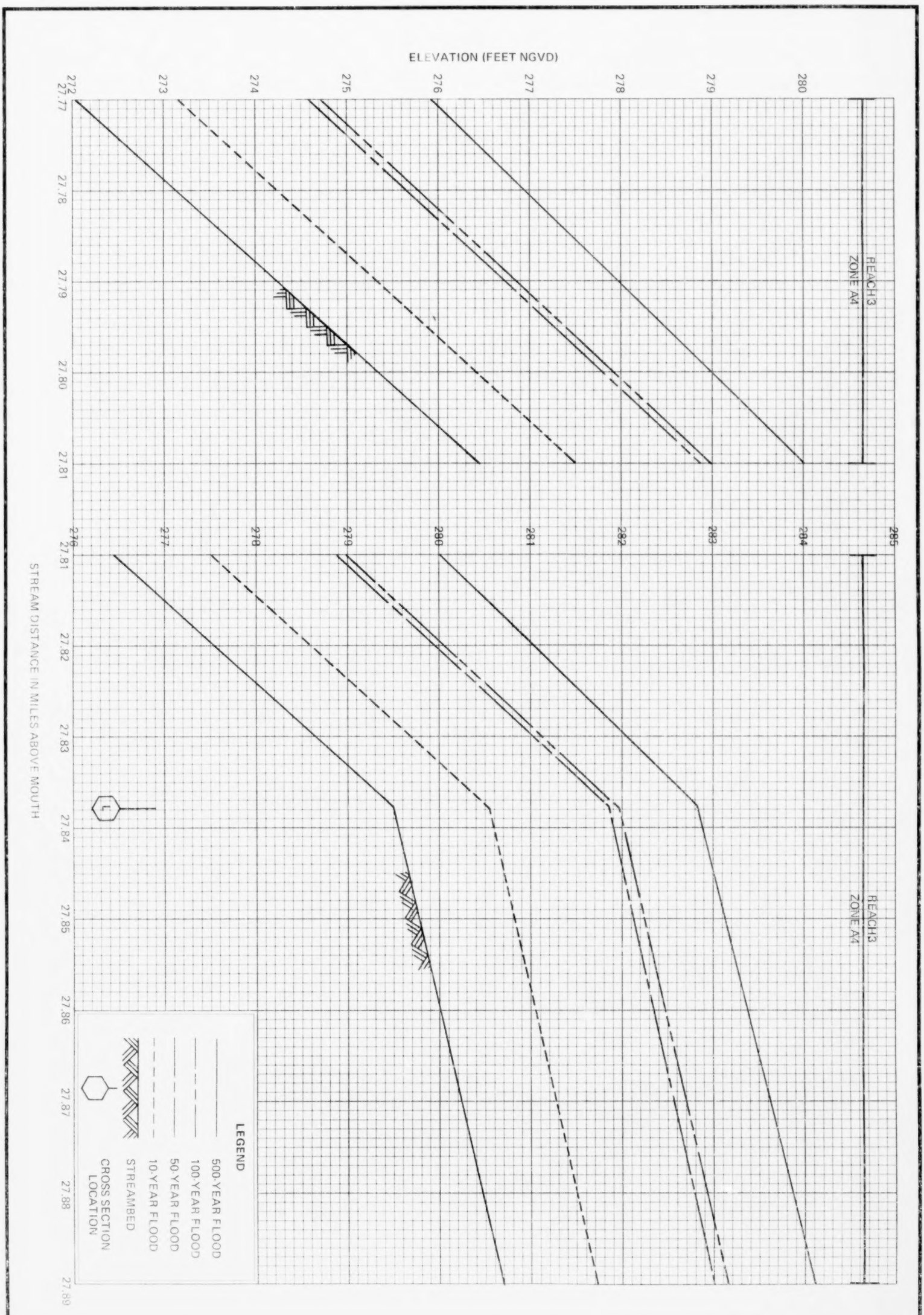

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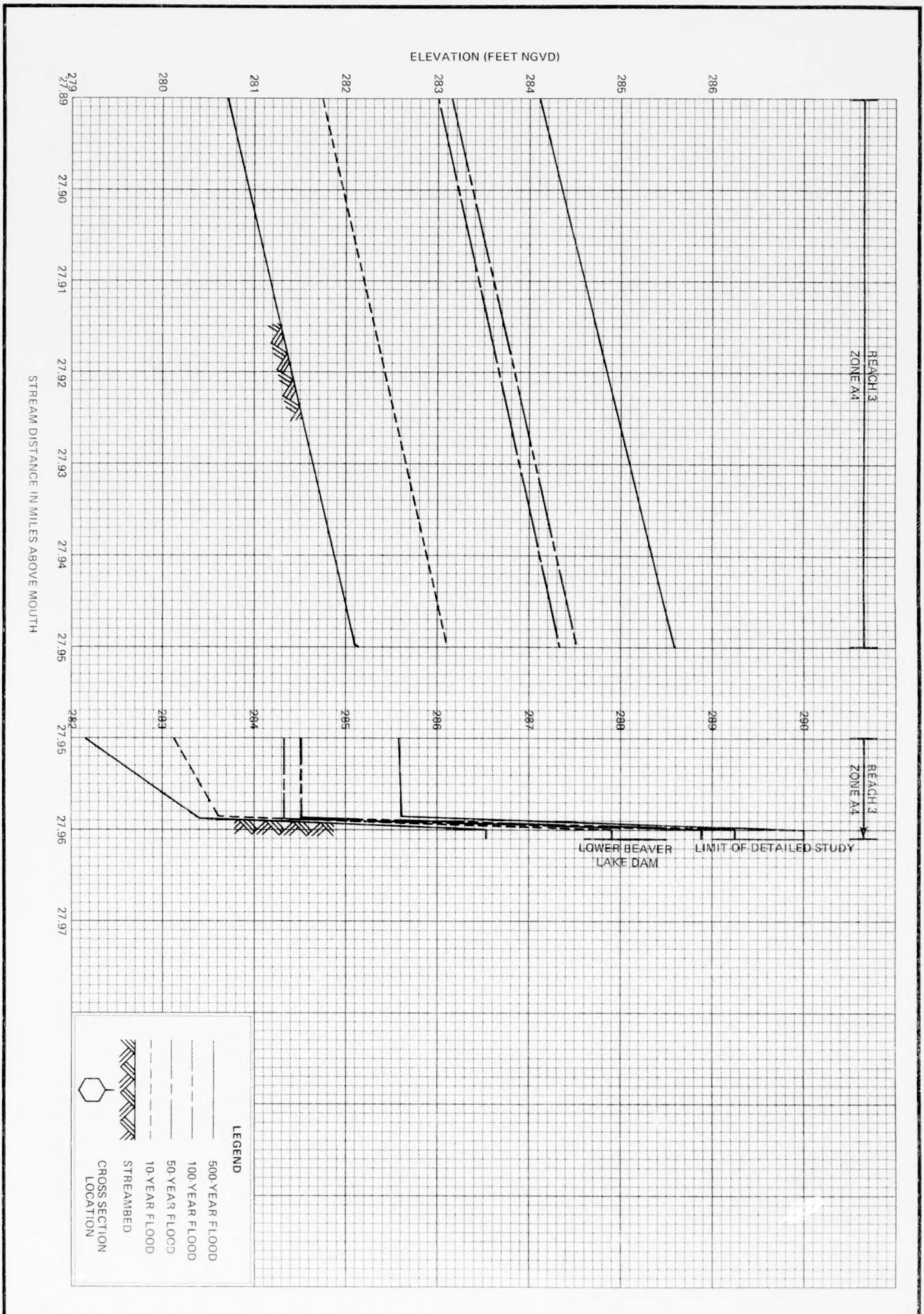
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK



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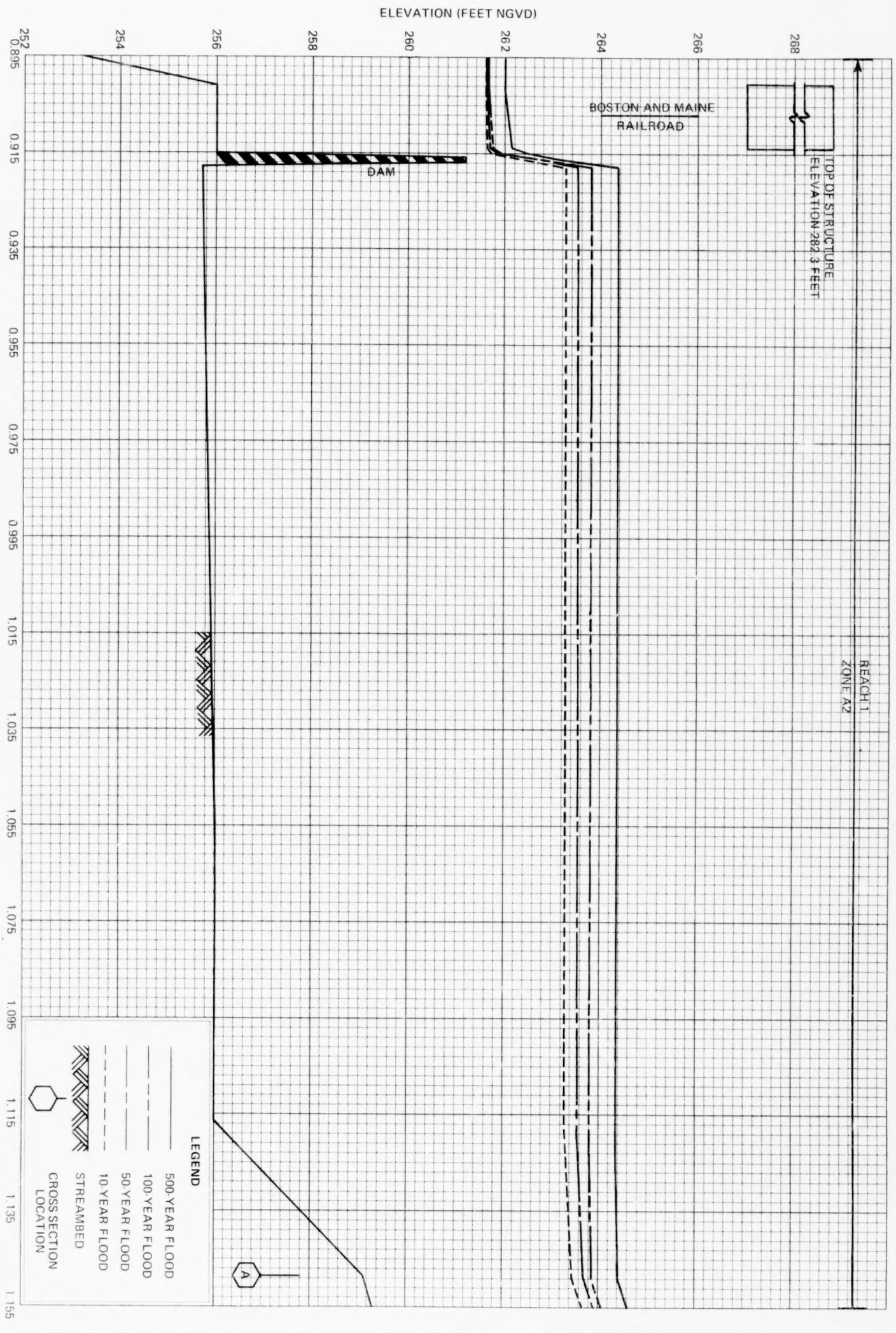
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

BEAVER BROOK

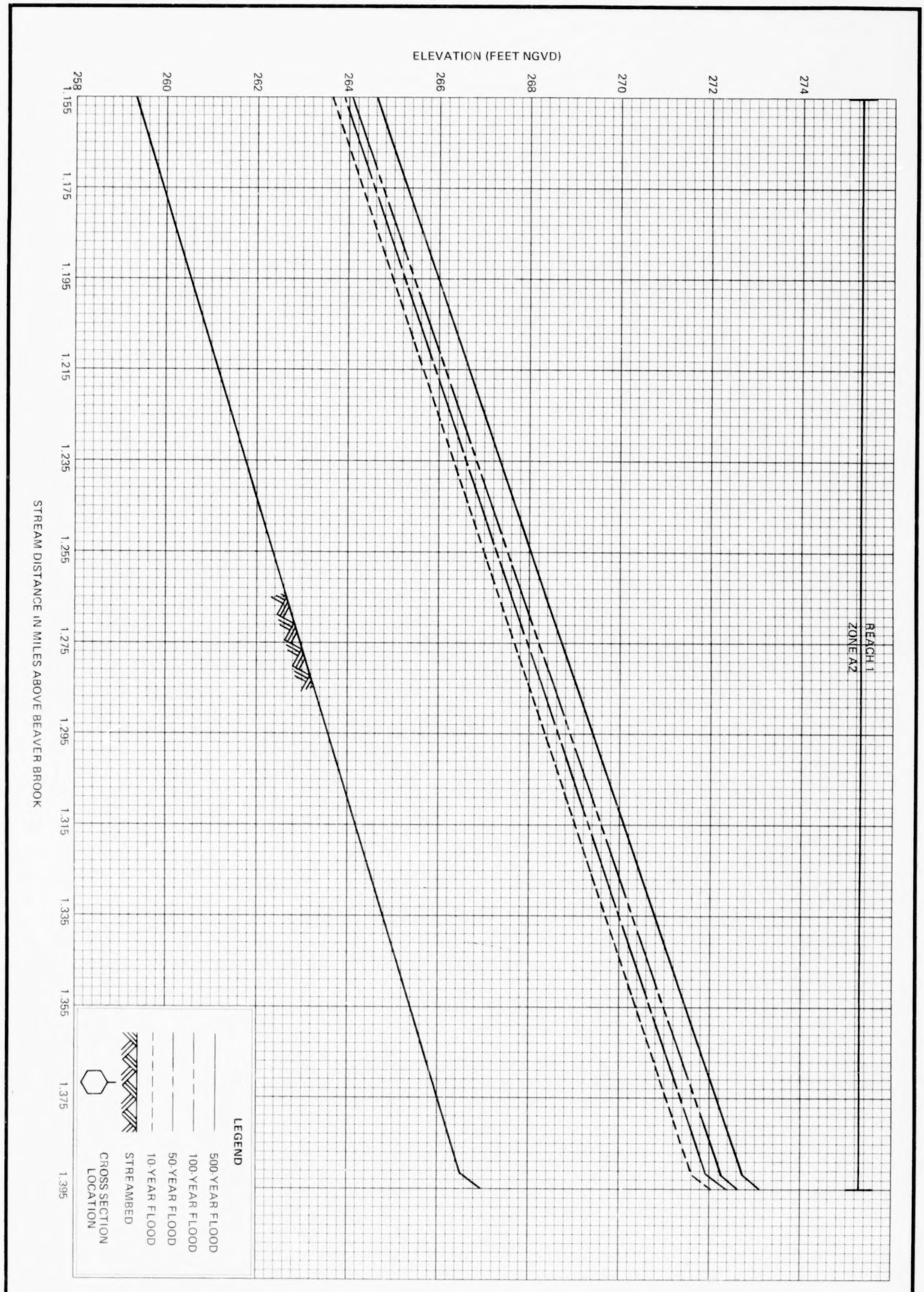


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



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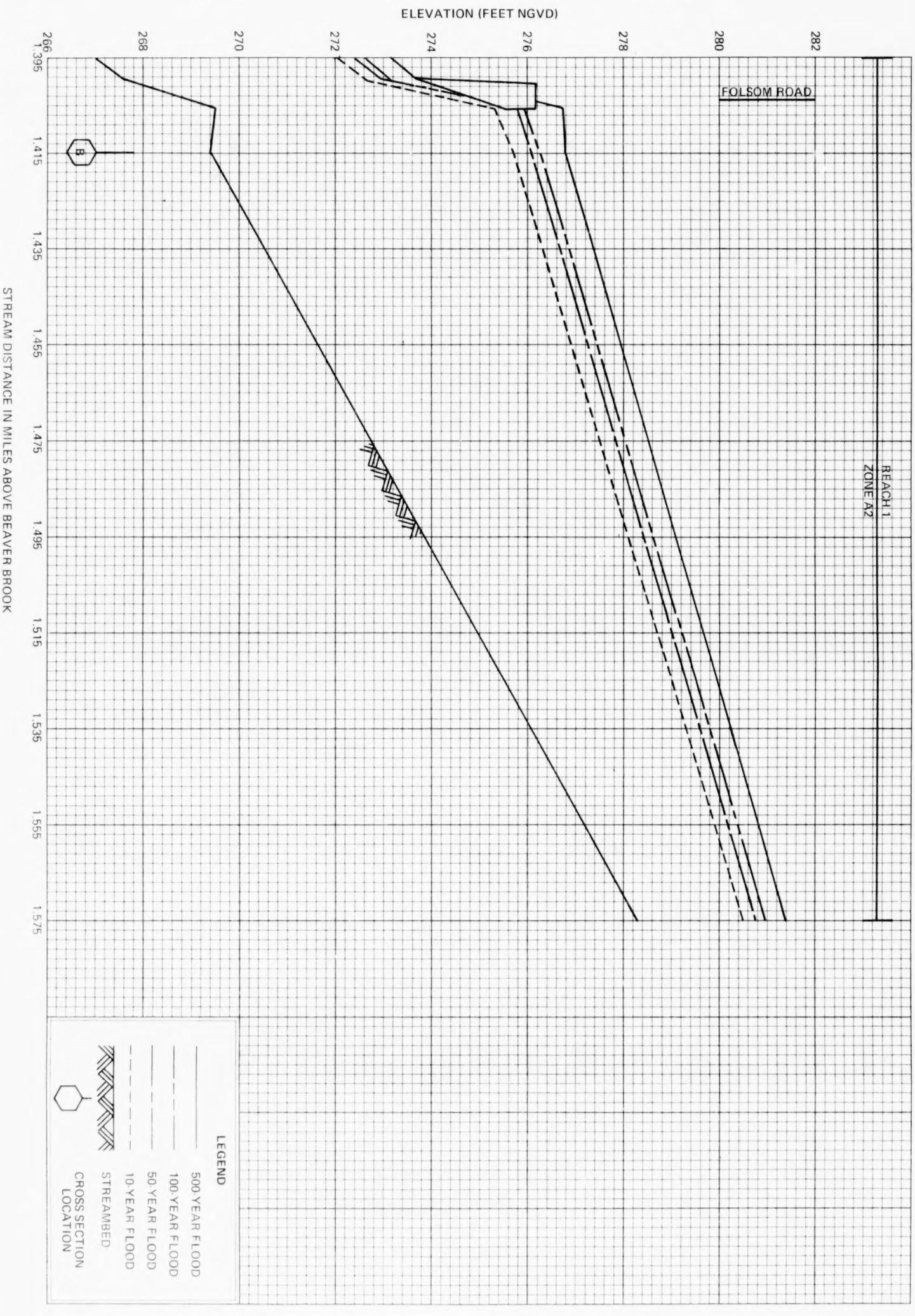
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



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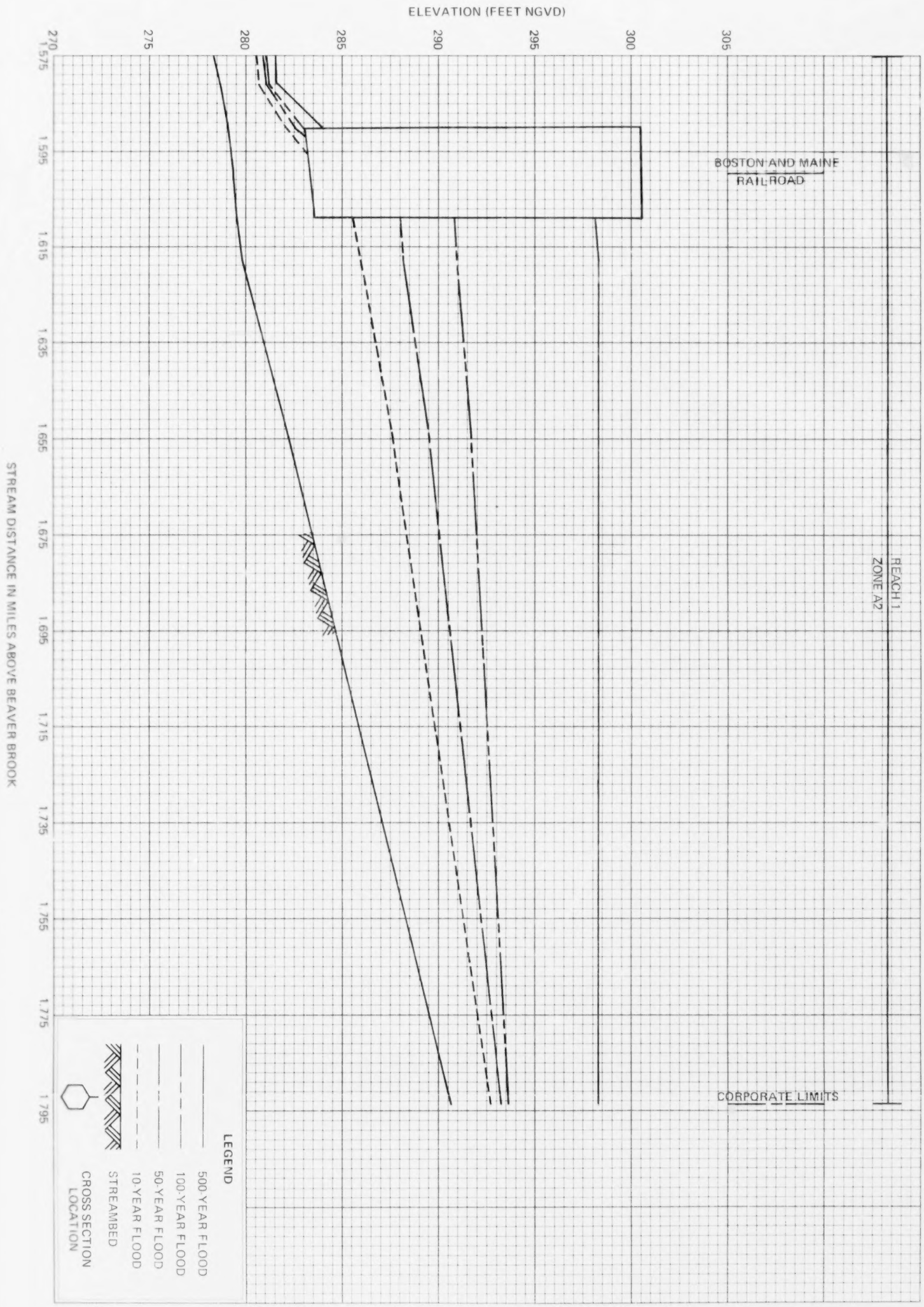
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



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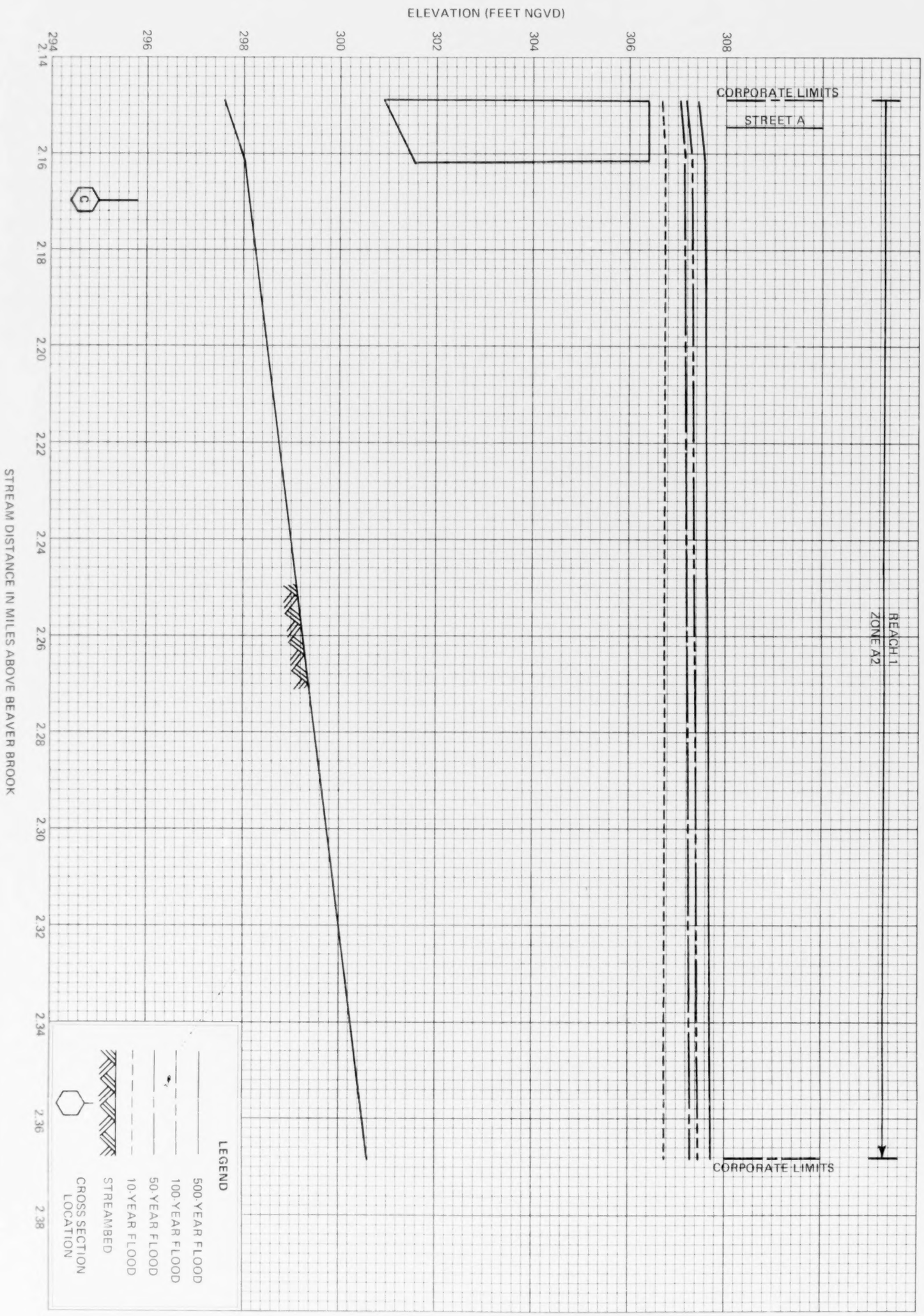
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK

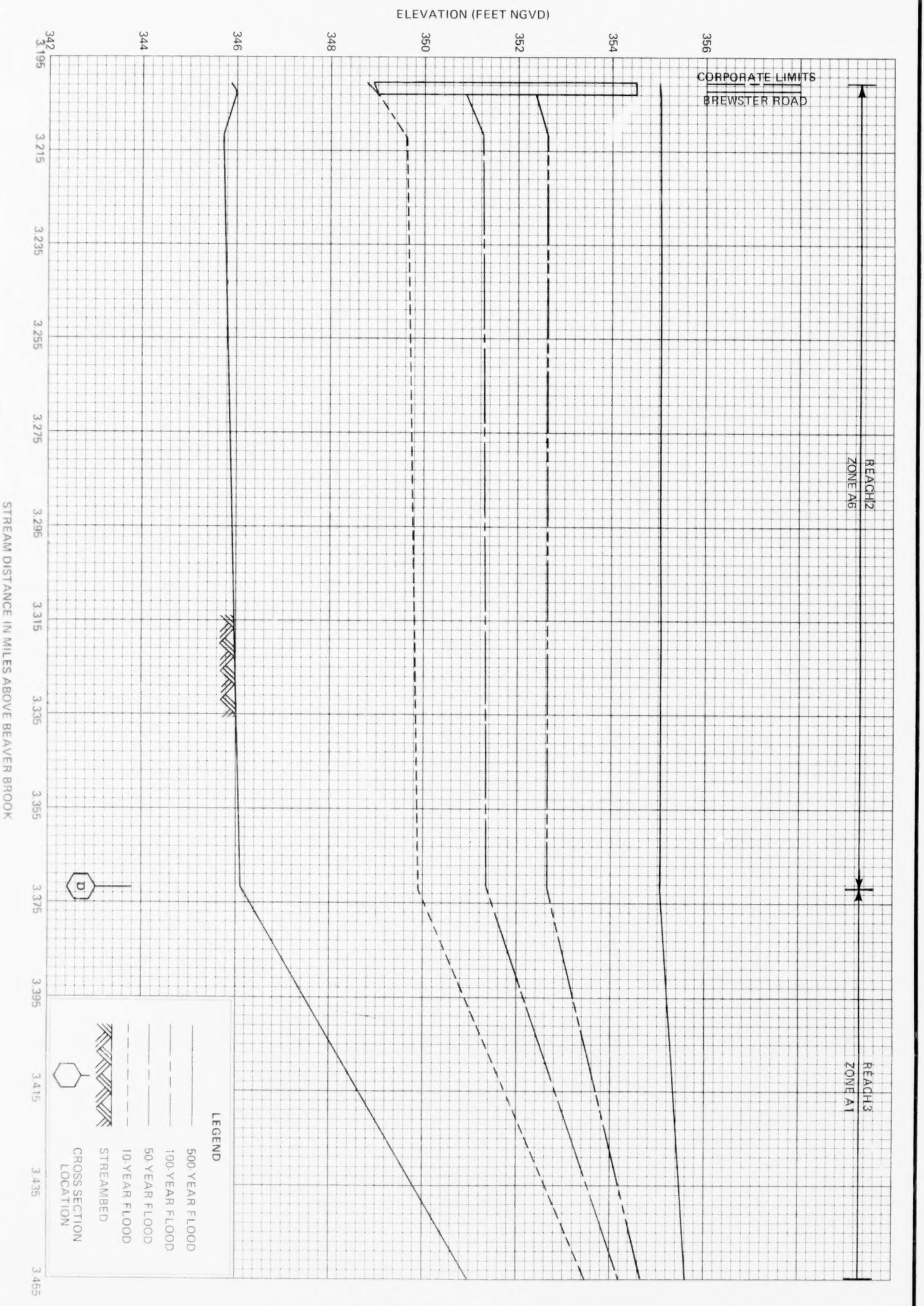


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



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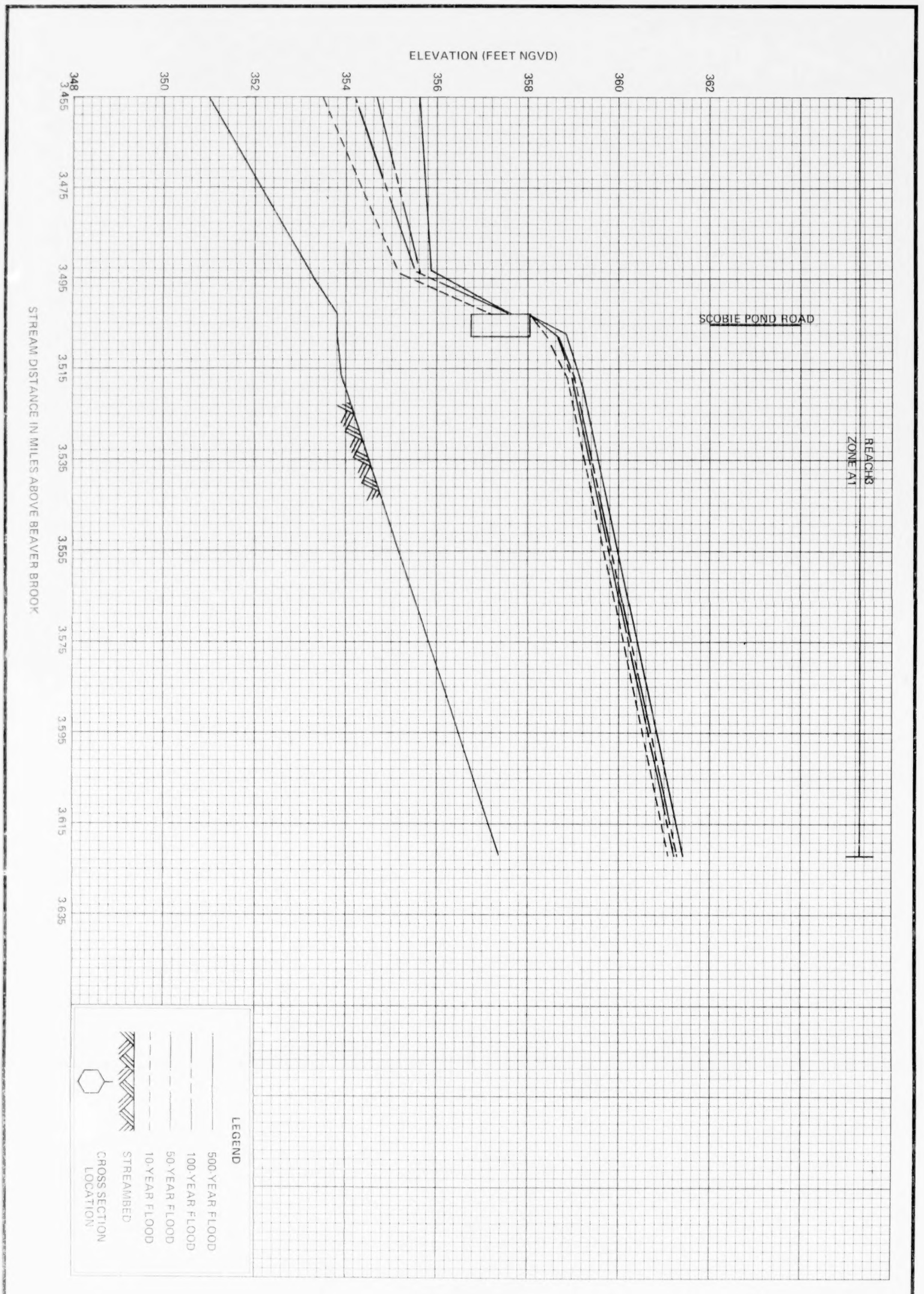
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



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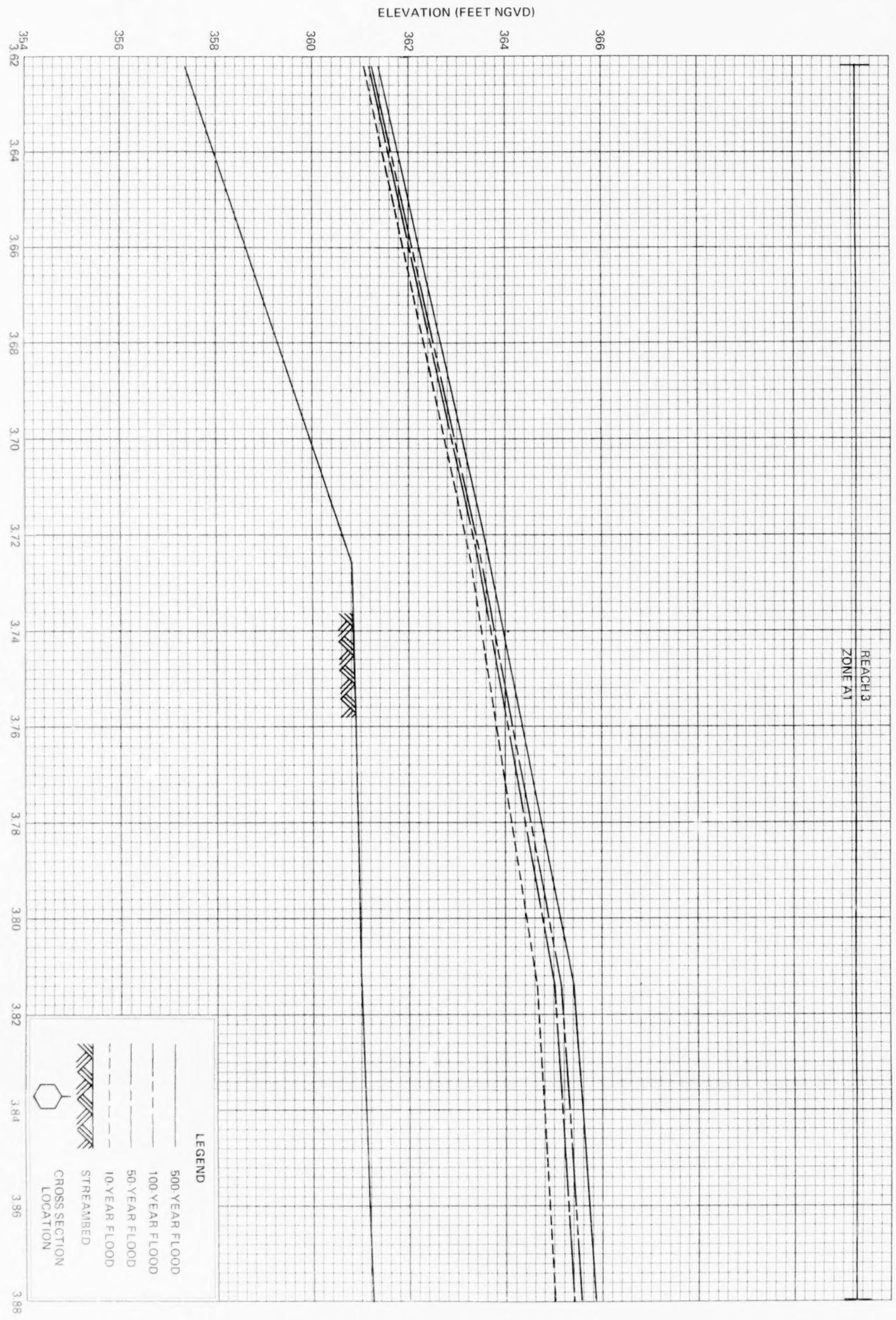
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



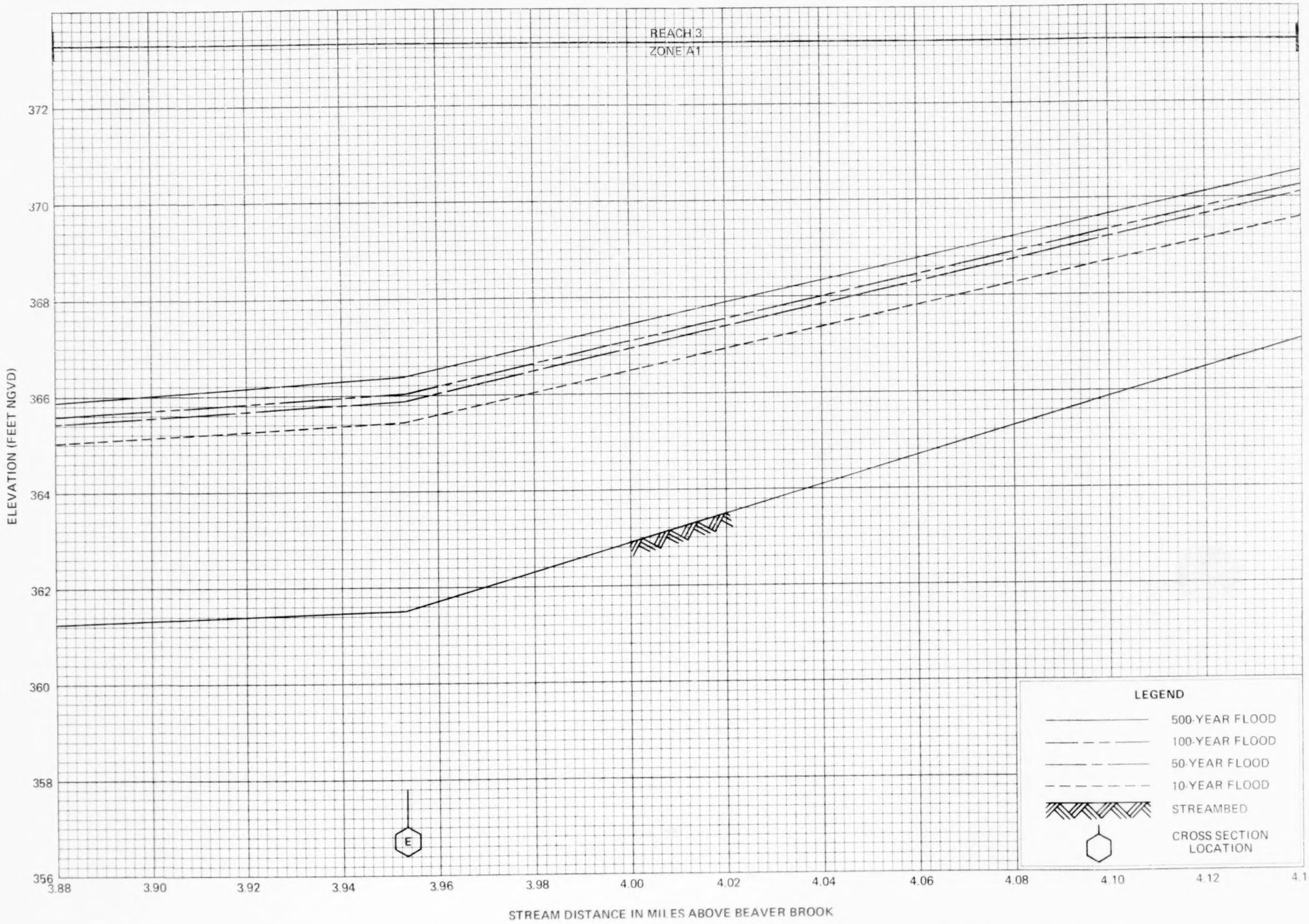
16P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



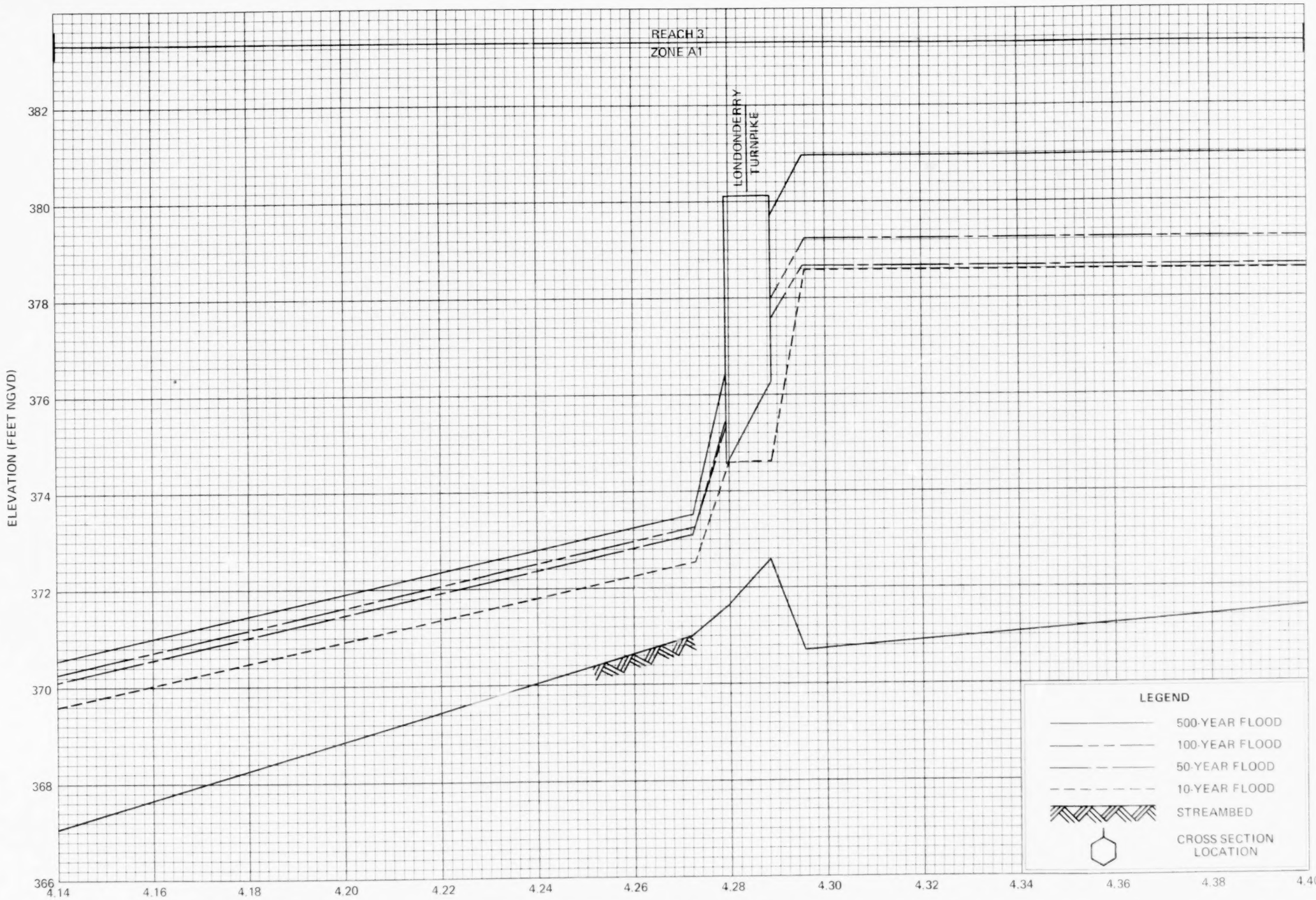
FLOOD PROFILES

SHIELDS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

17P



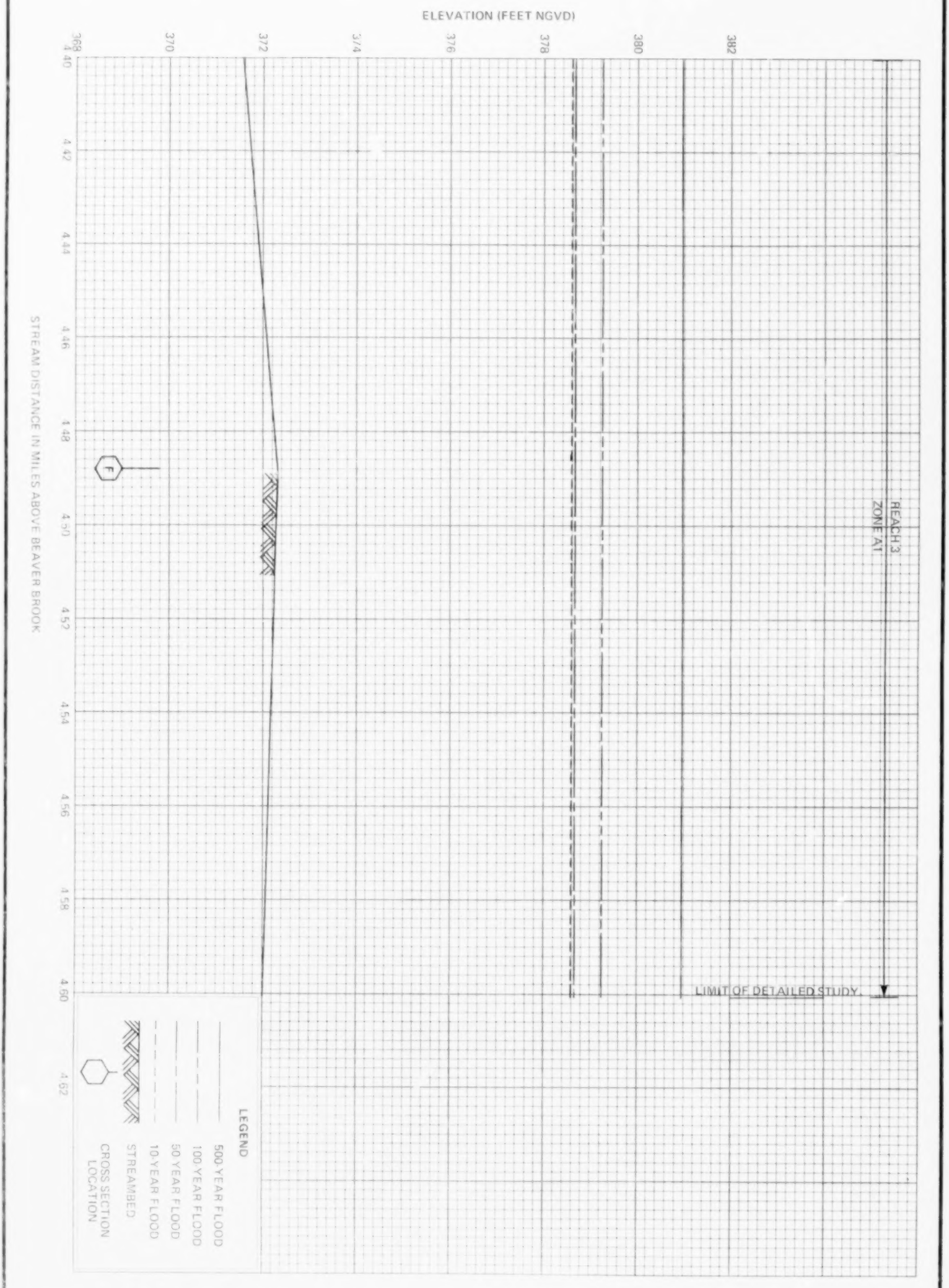
FLOOD PROFILES

SHIELDS BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

18P



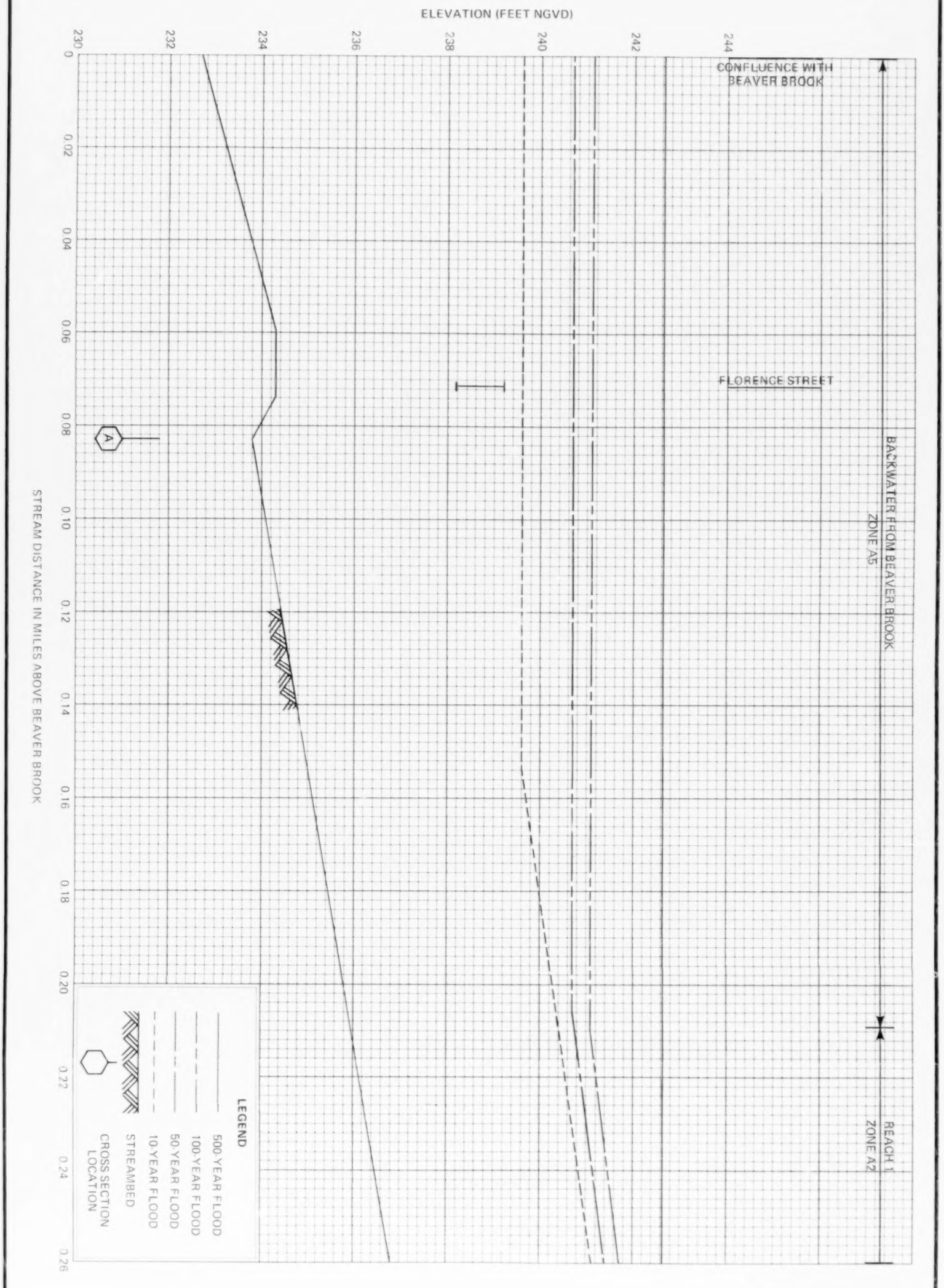
19P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

SHIELDS BROOK



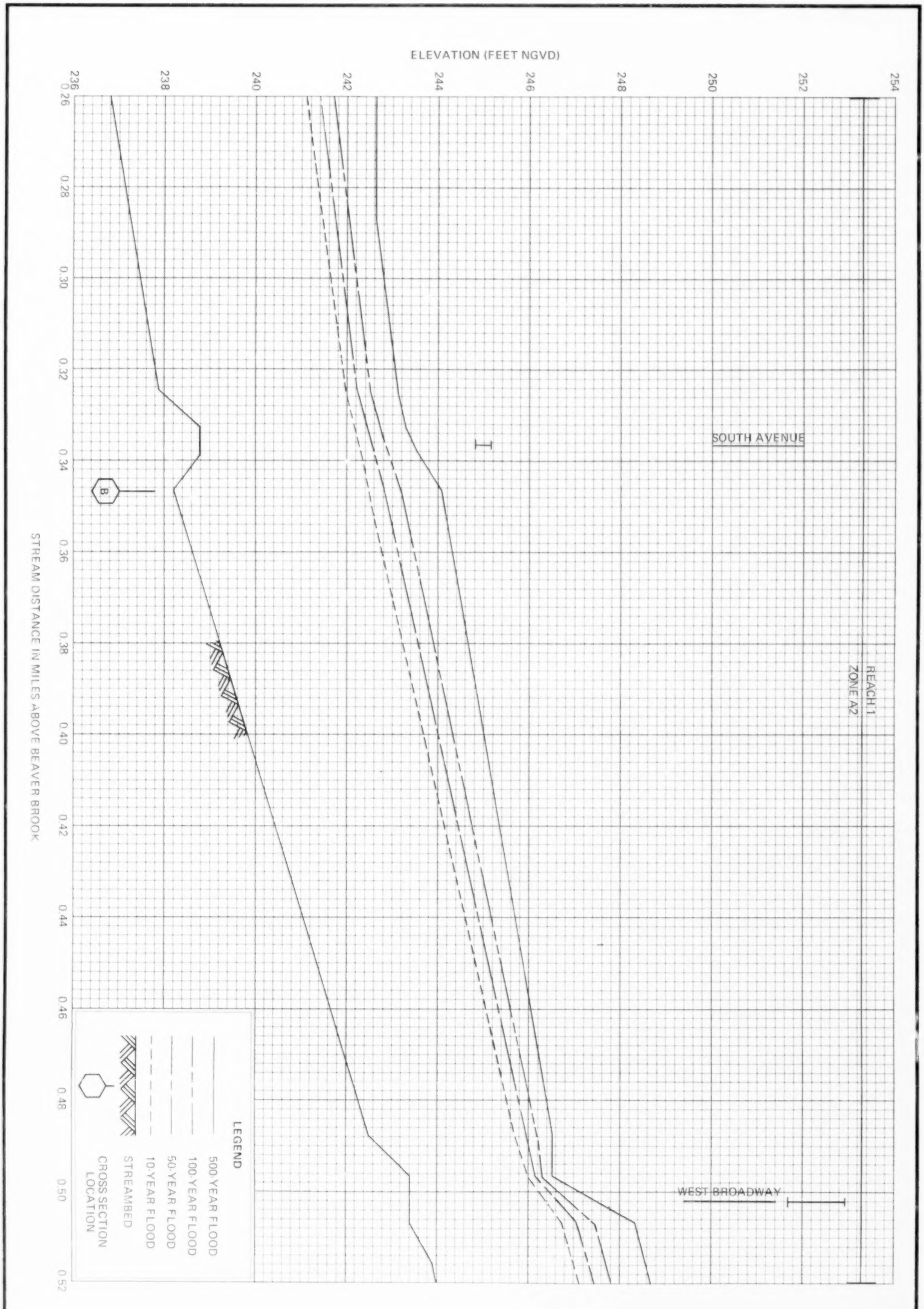
20P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

HORNES BROOK



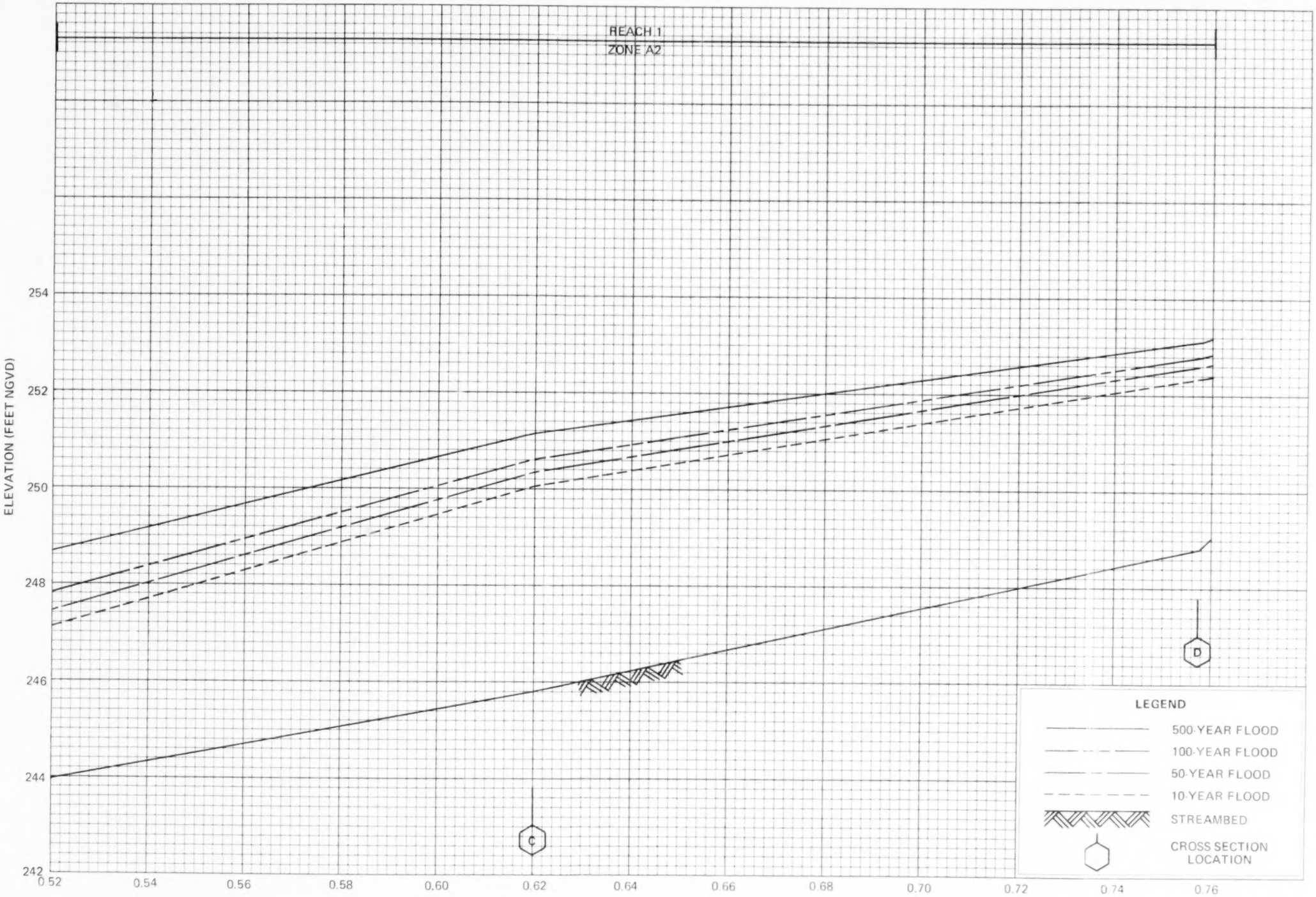
21P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

HORNES BROOK



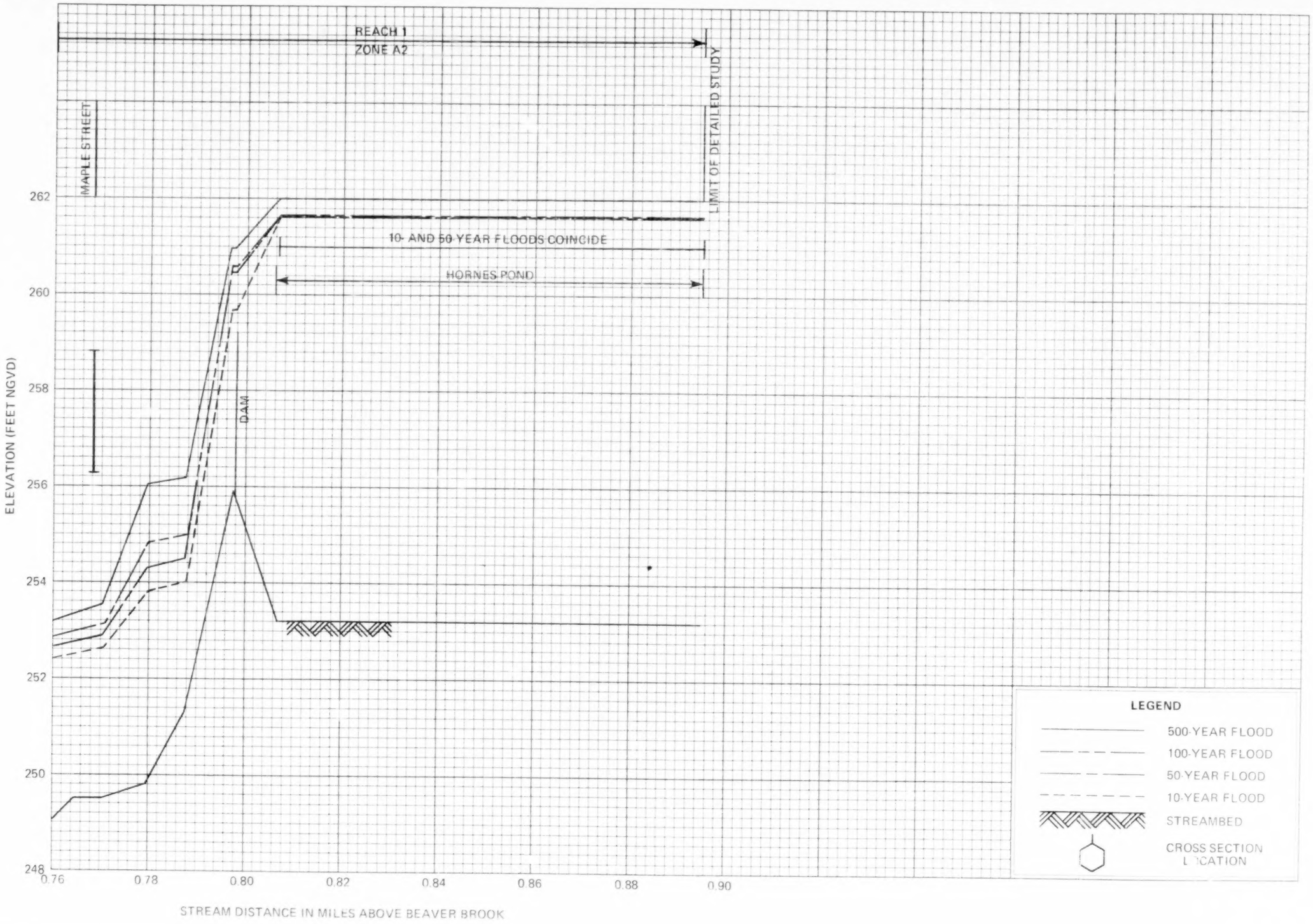
FLOOD PROFILES

HORNES BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

22P



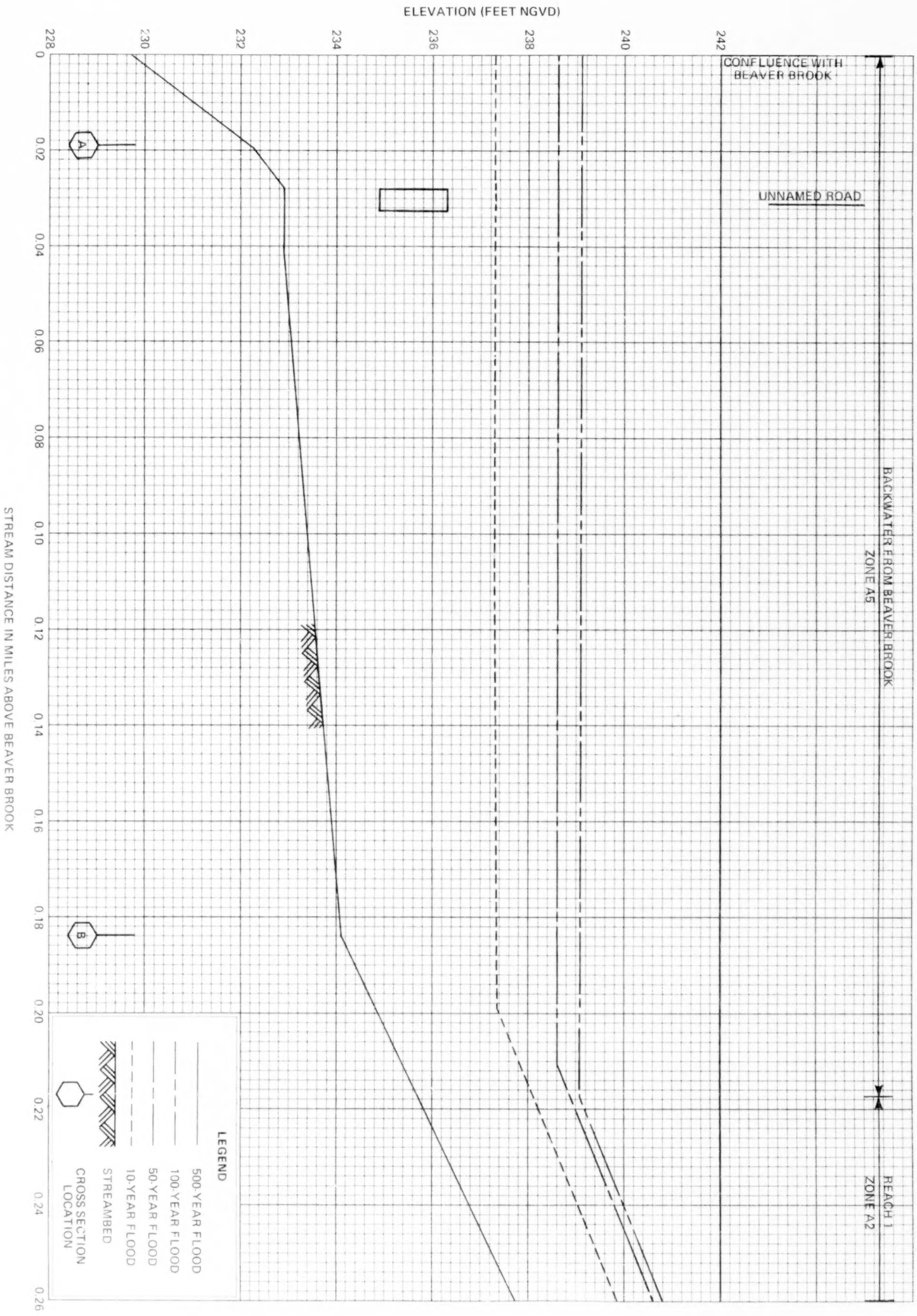
FLOOD PROFILES

HORNES BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

23P



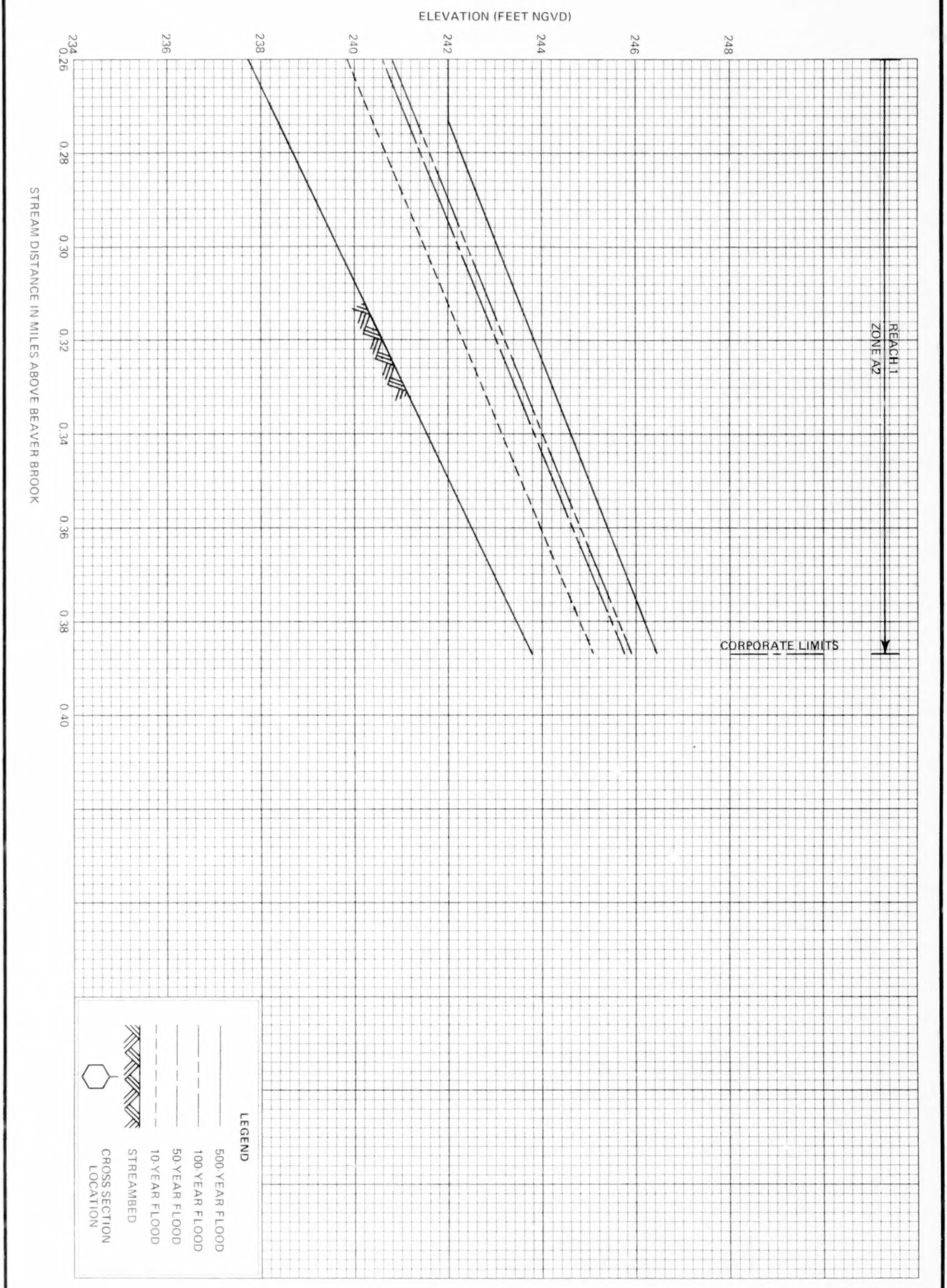
24P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY 0



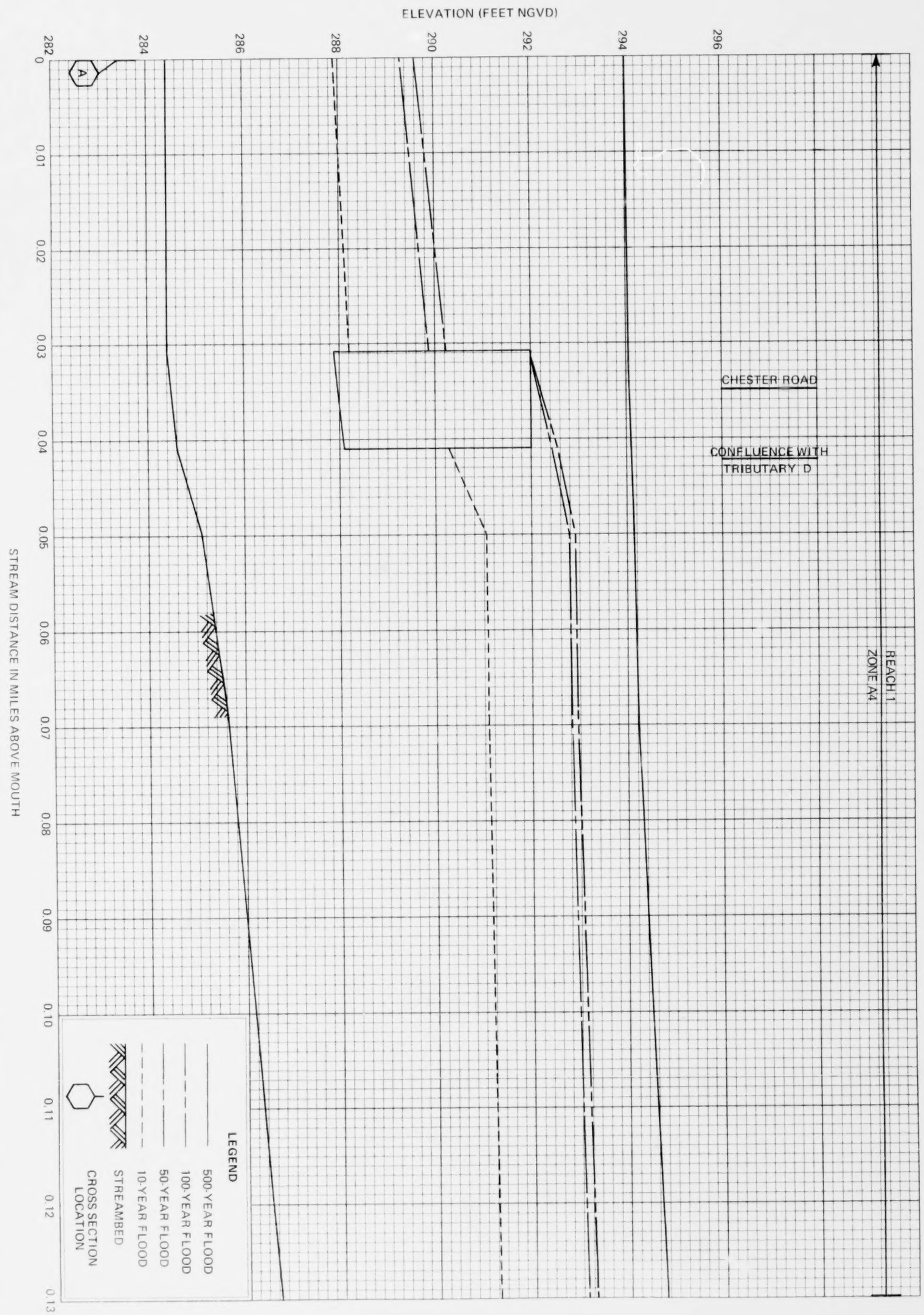
25P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY 0

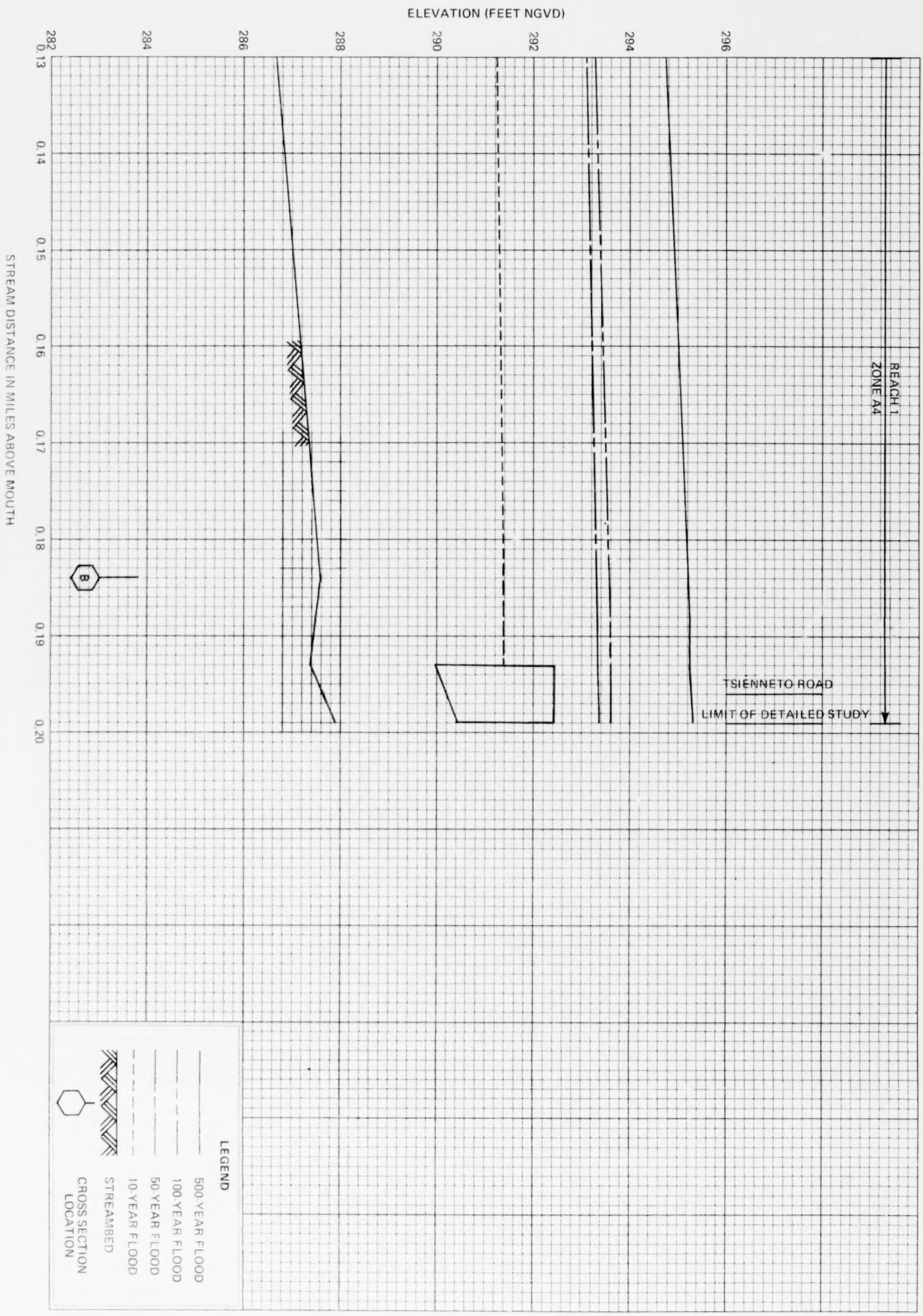


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY E



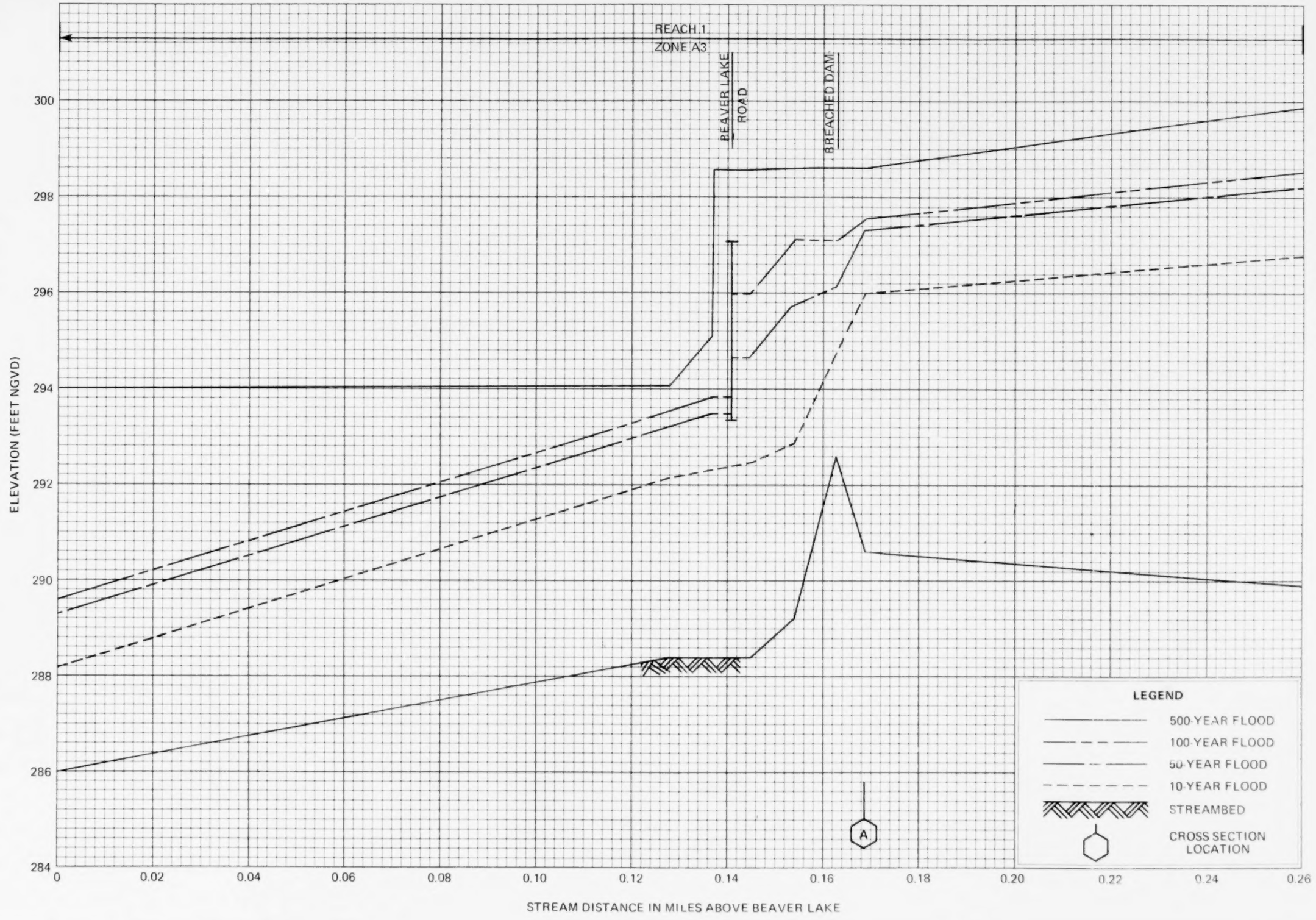
27P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY E



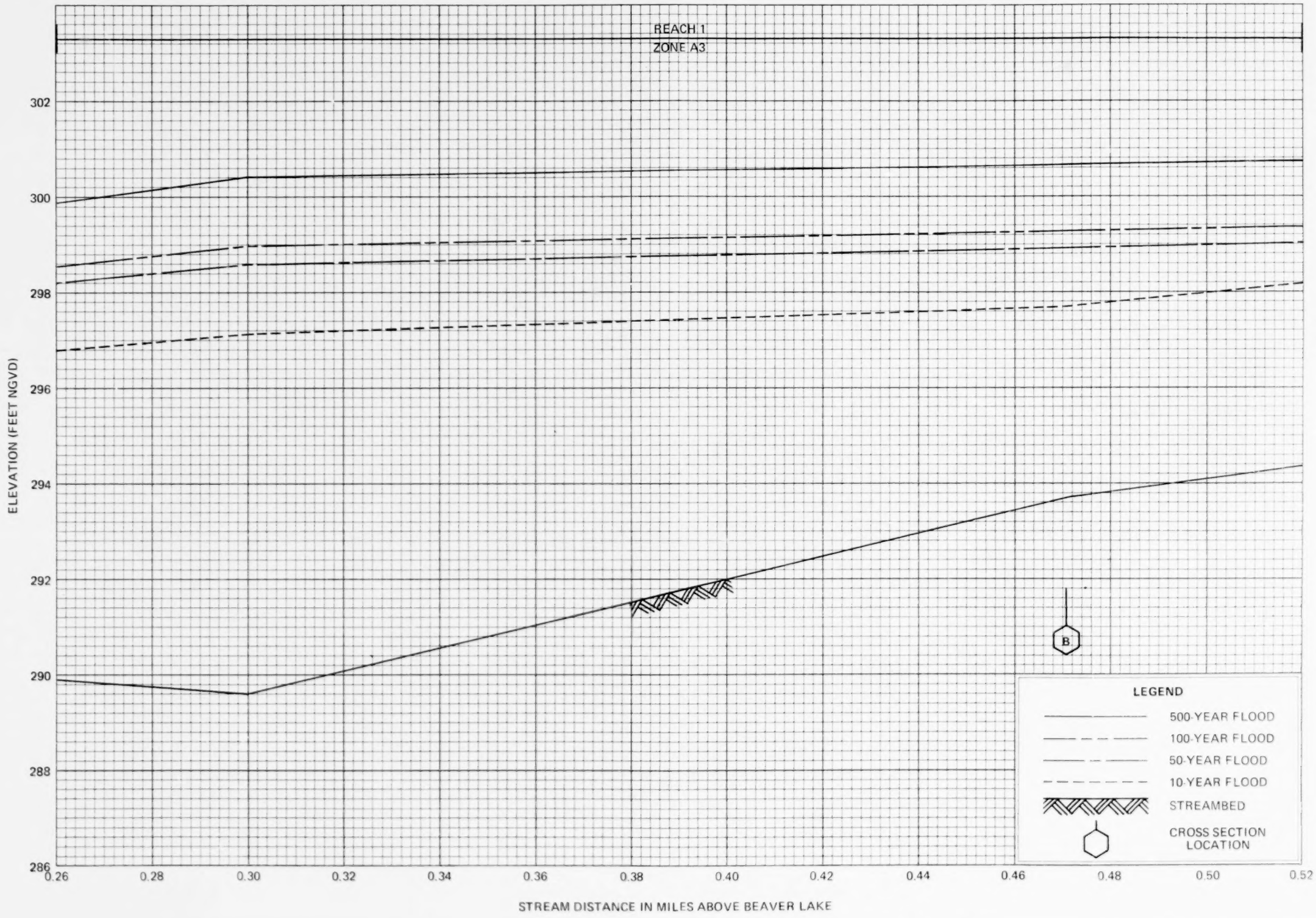
FLOOD PROFILES

TRIBUTARY F

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

28P



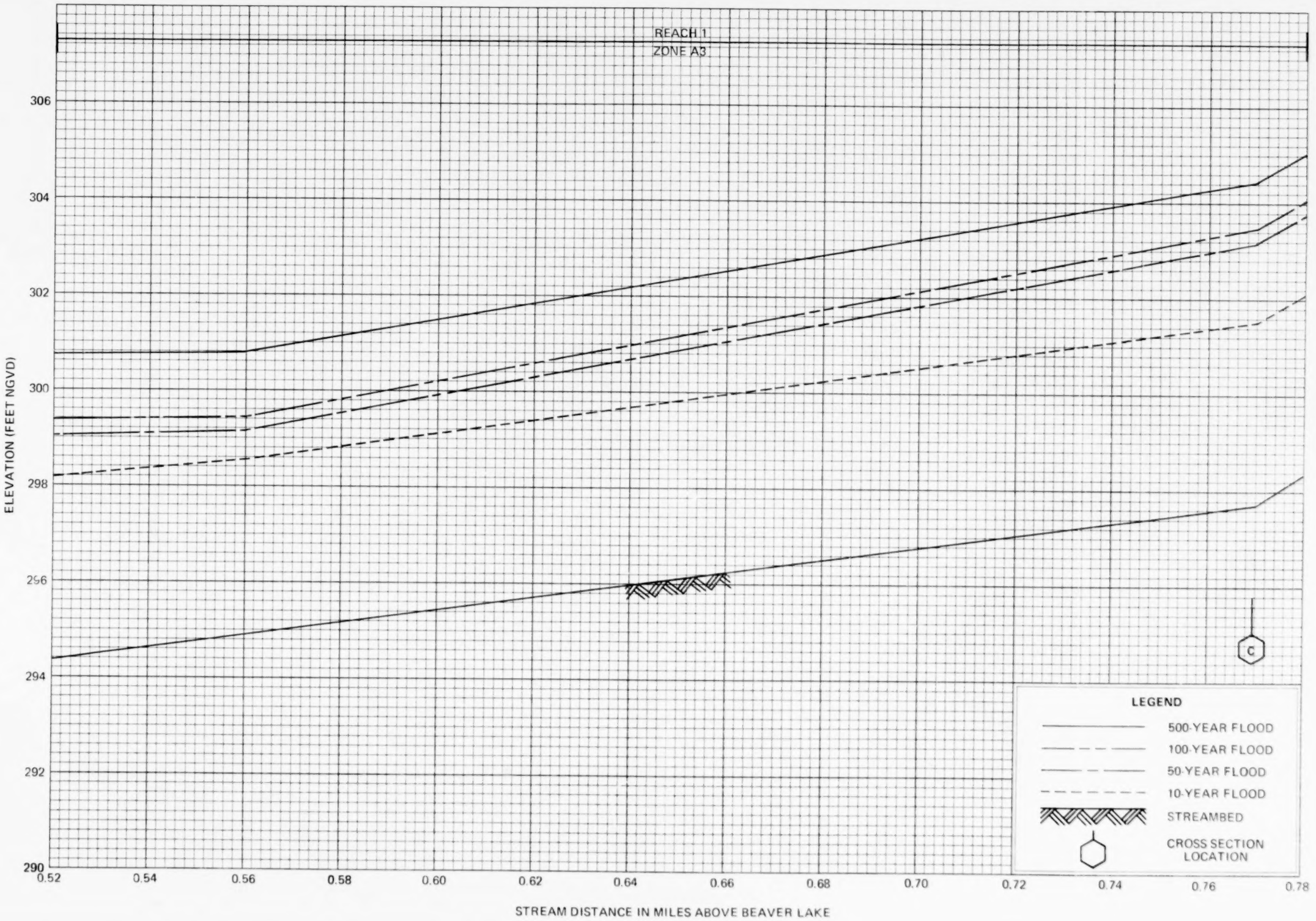
FLOOD PROFILES

TRIBUTARY F

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

29P



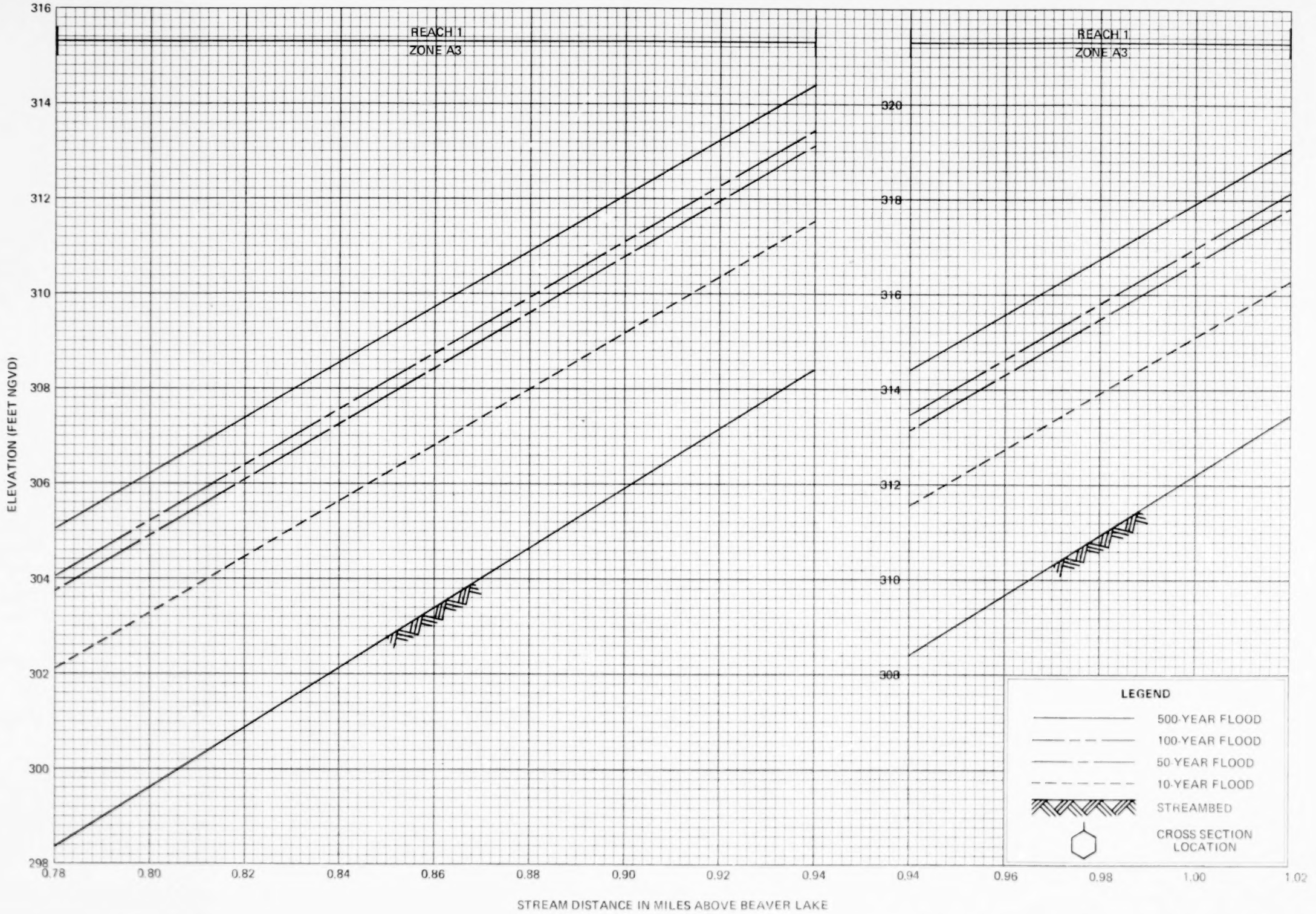
FLOOD PROFILES

TRIBUTARY F

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

30P



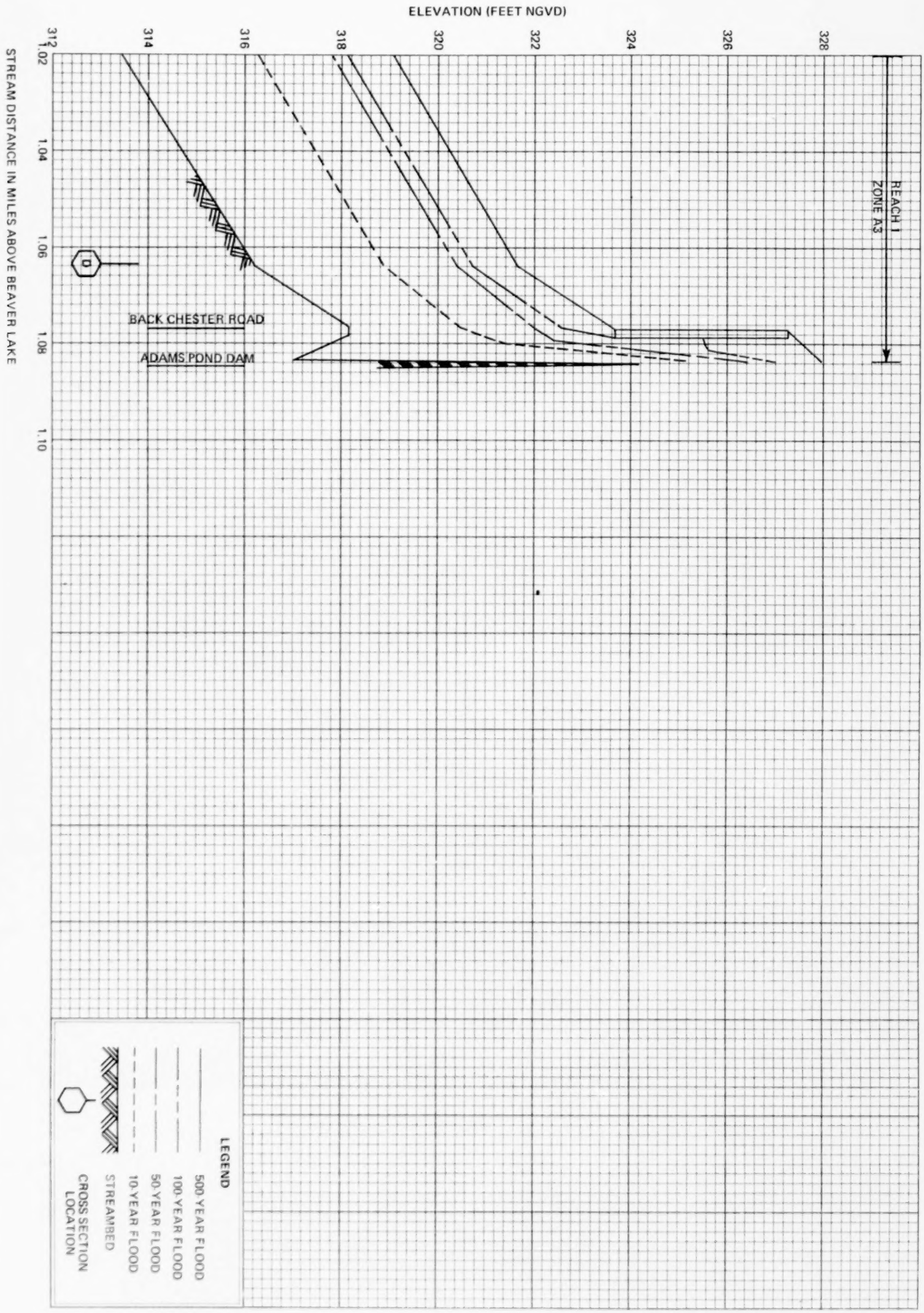
FLOOD PROFILES

TRIBUTARY F

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

31P

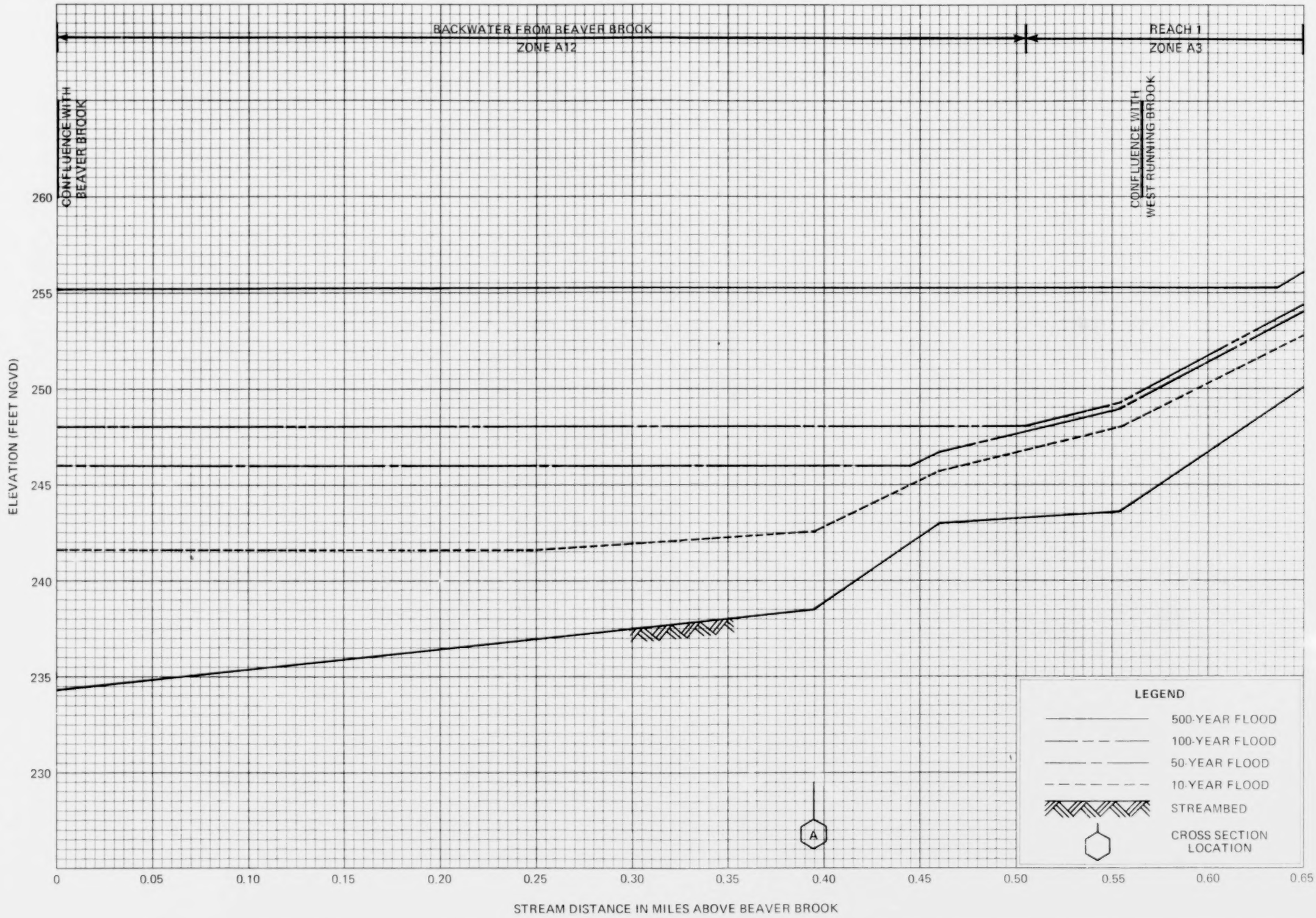


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY F



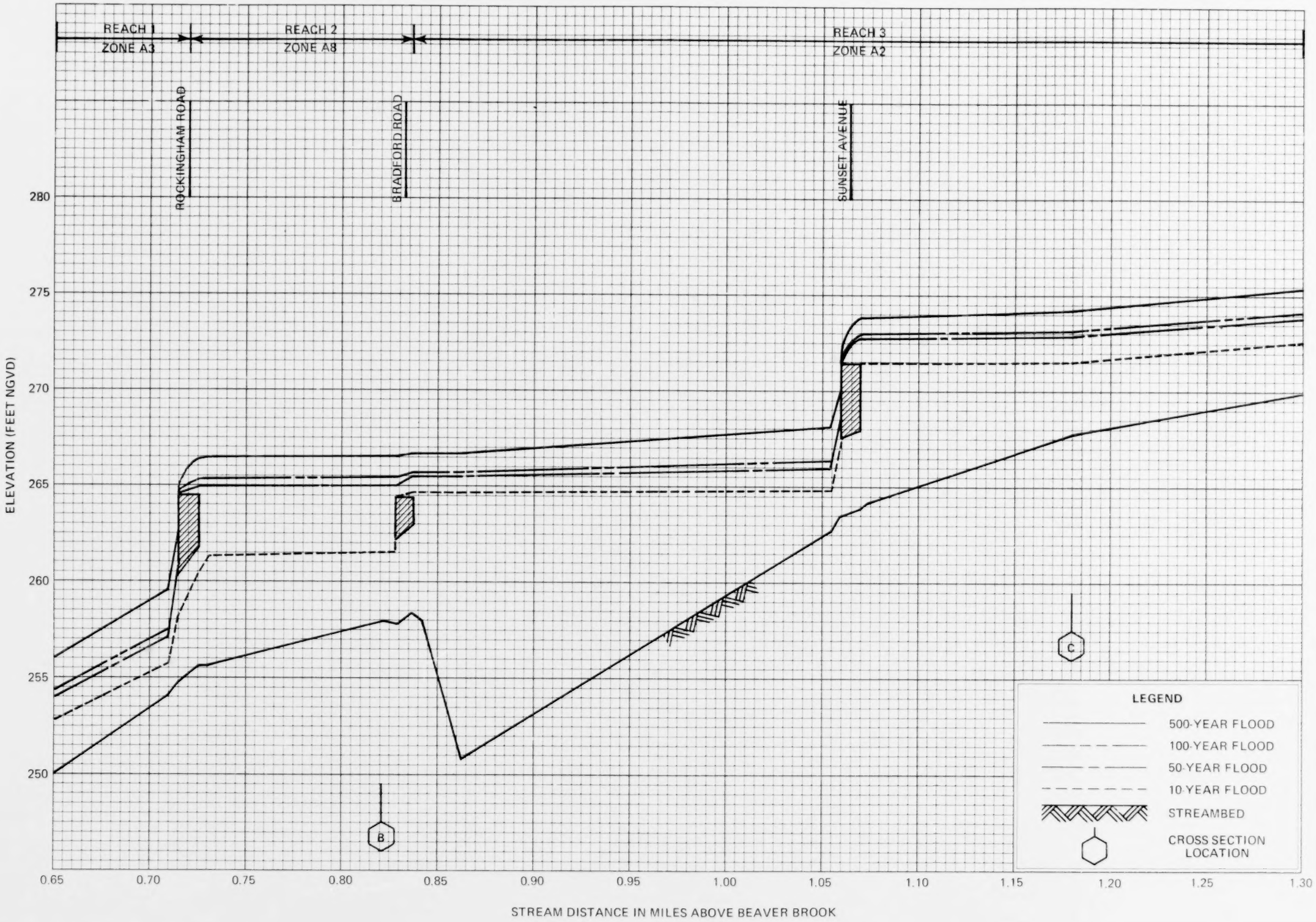
FLOOD PROFILES

TRIBUTARY G

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

33P



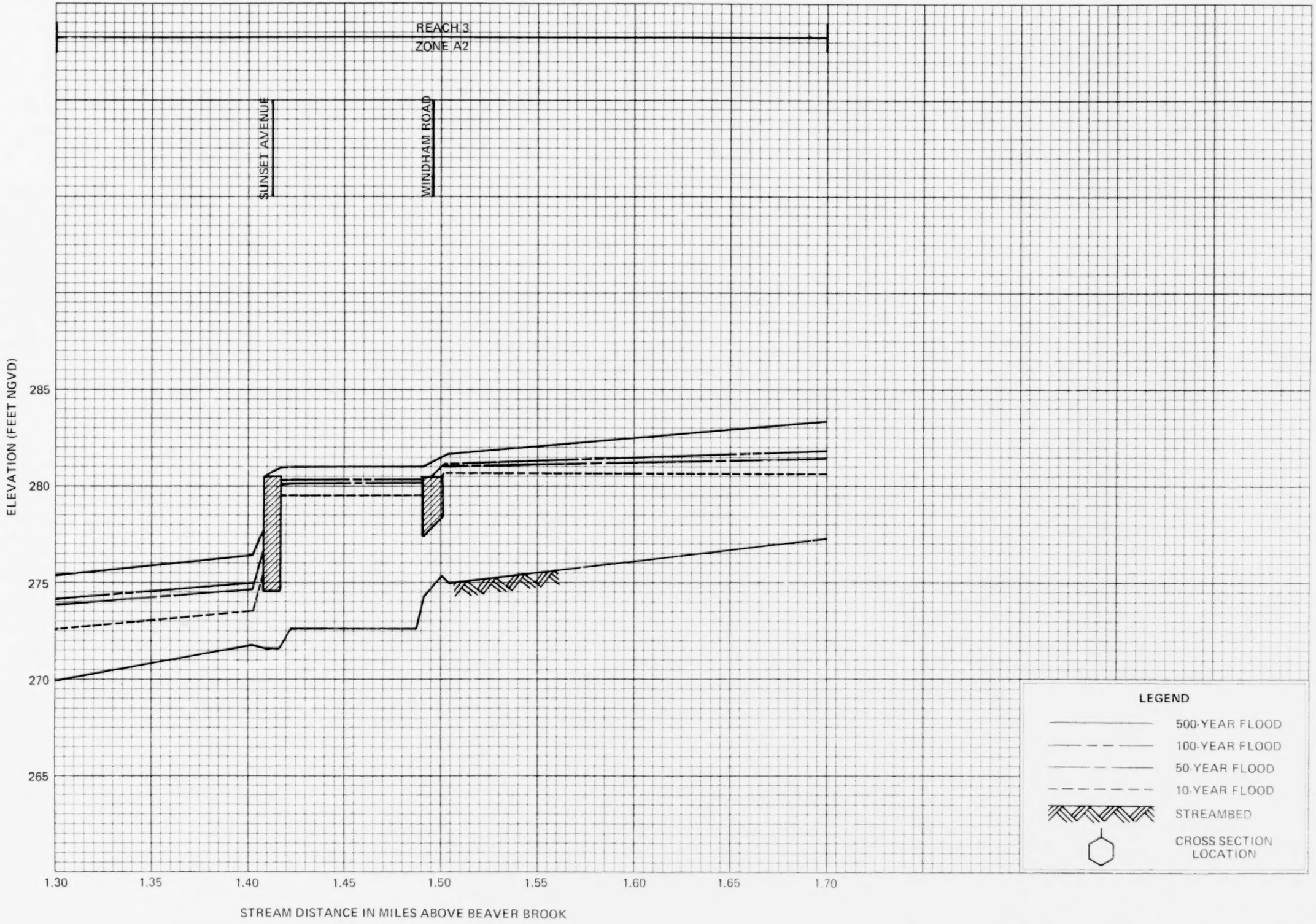
FLOOD PROFILES

TRIBUTARY G

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

34P



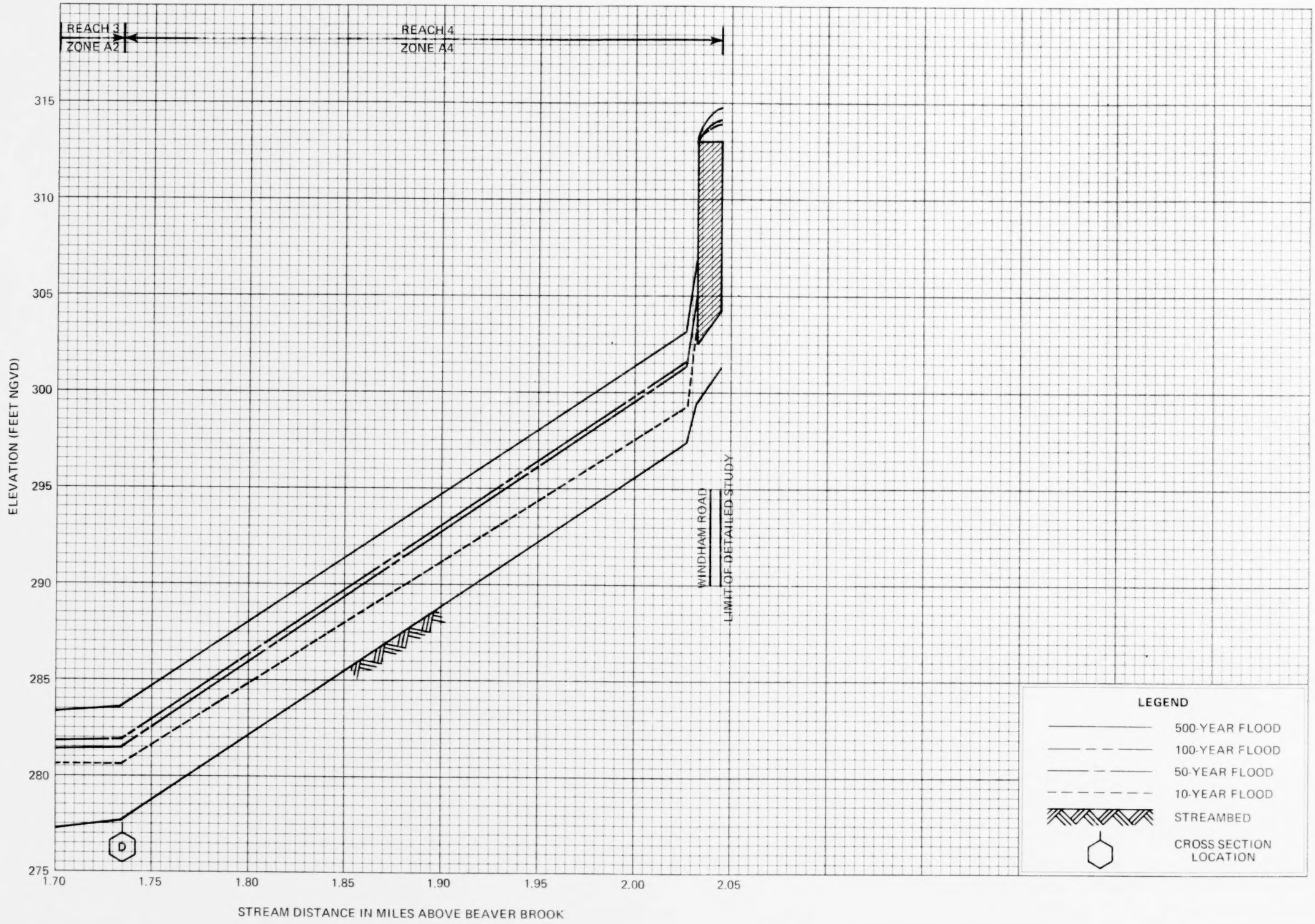
FLOOD PROFILES

TRIBUTARY G

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

35P



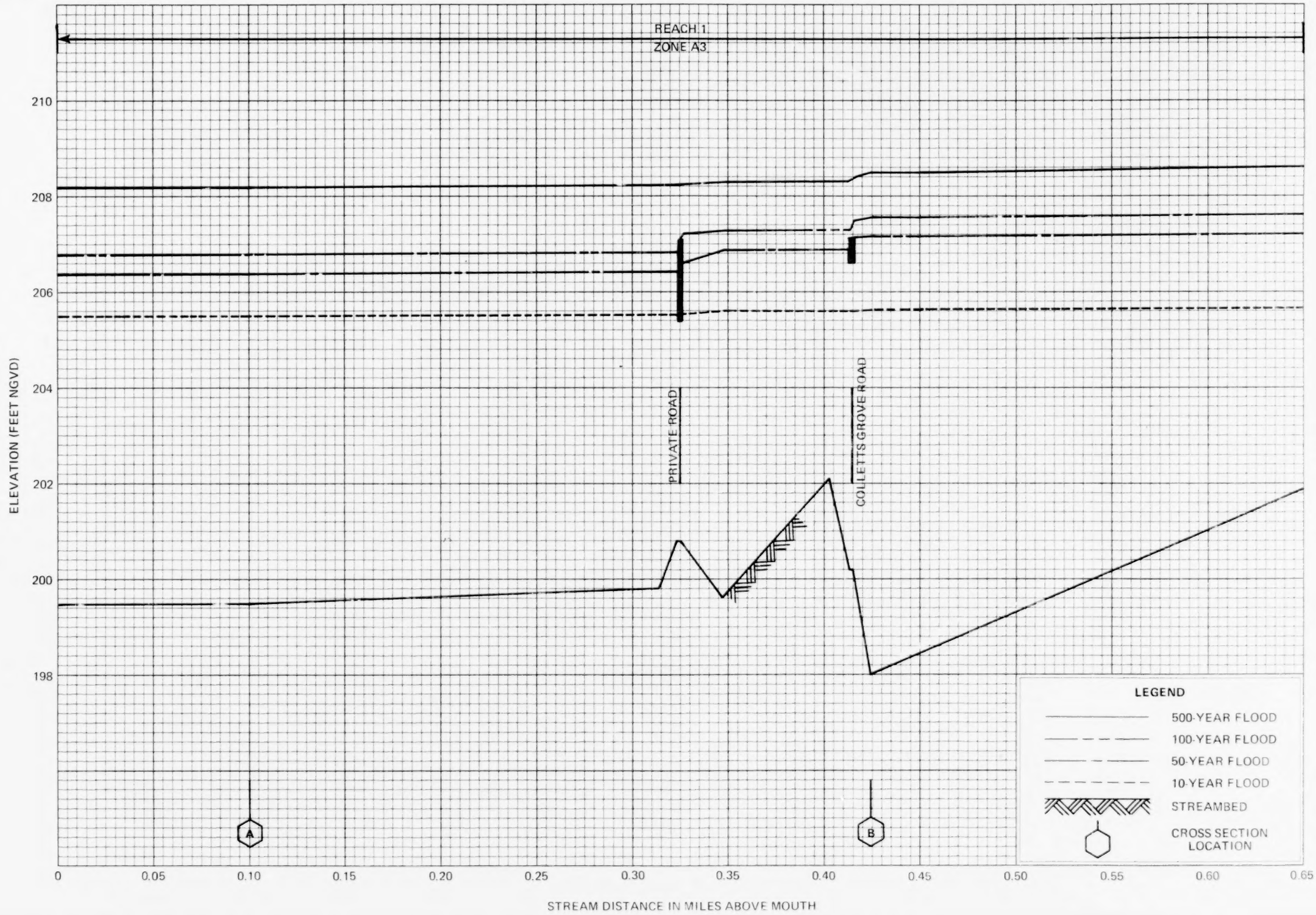
FLOOD PROFILES

TRIBUTARY G

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

36P



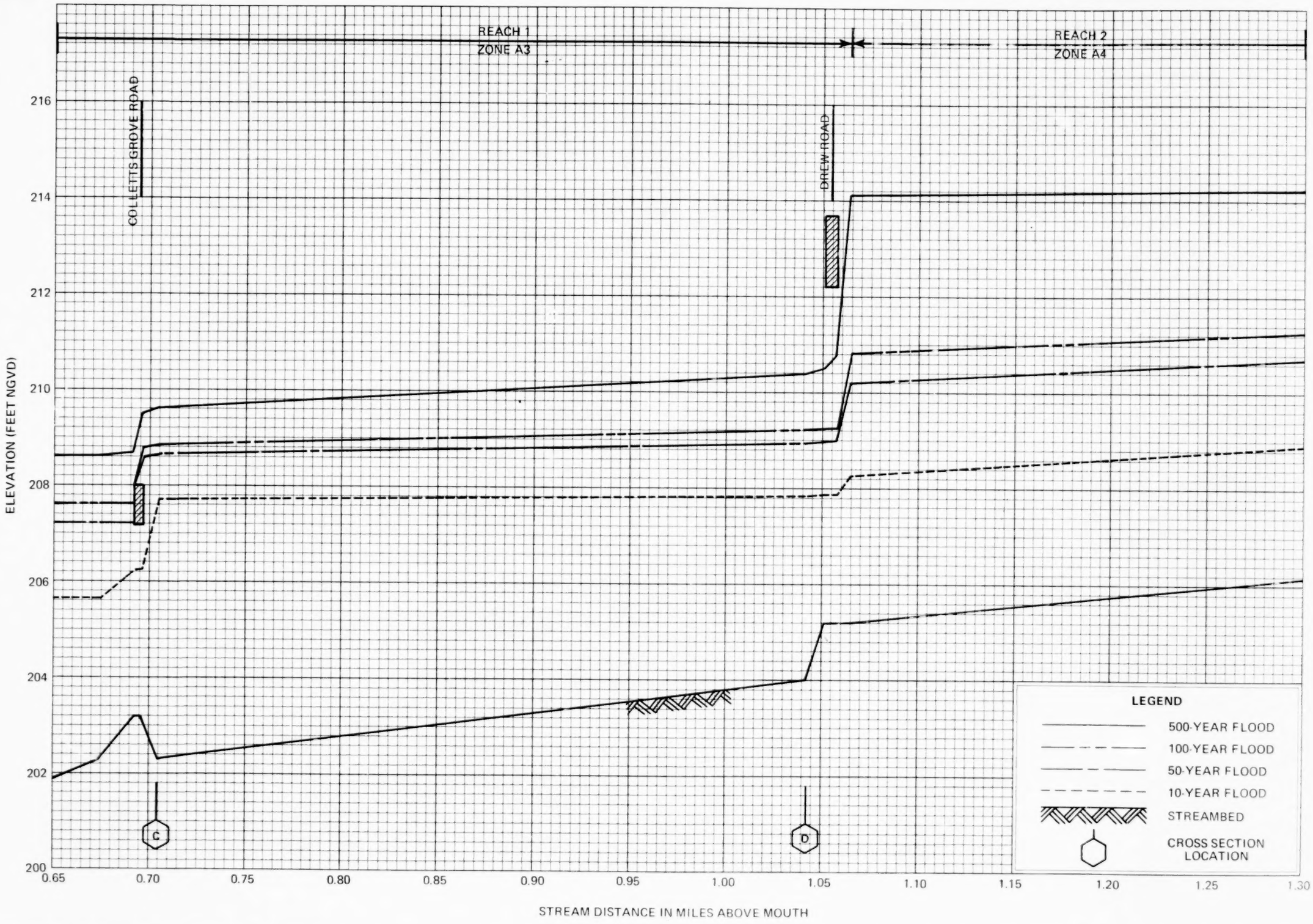
FLOOD PROFILES

DREW BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

37P



FLOOD PROFILES

DREW BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

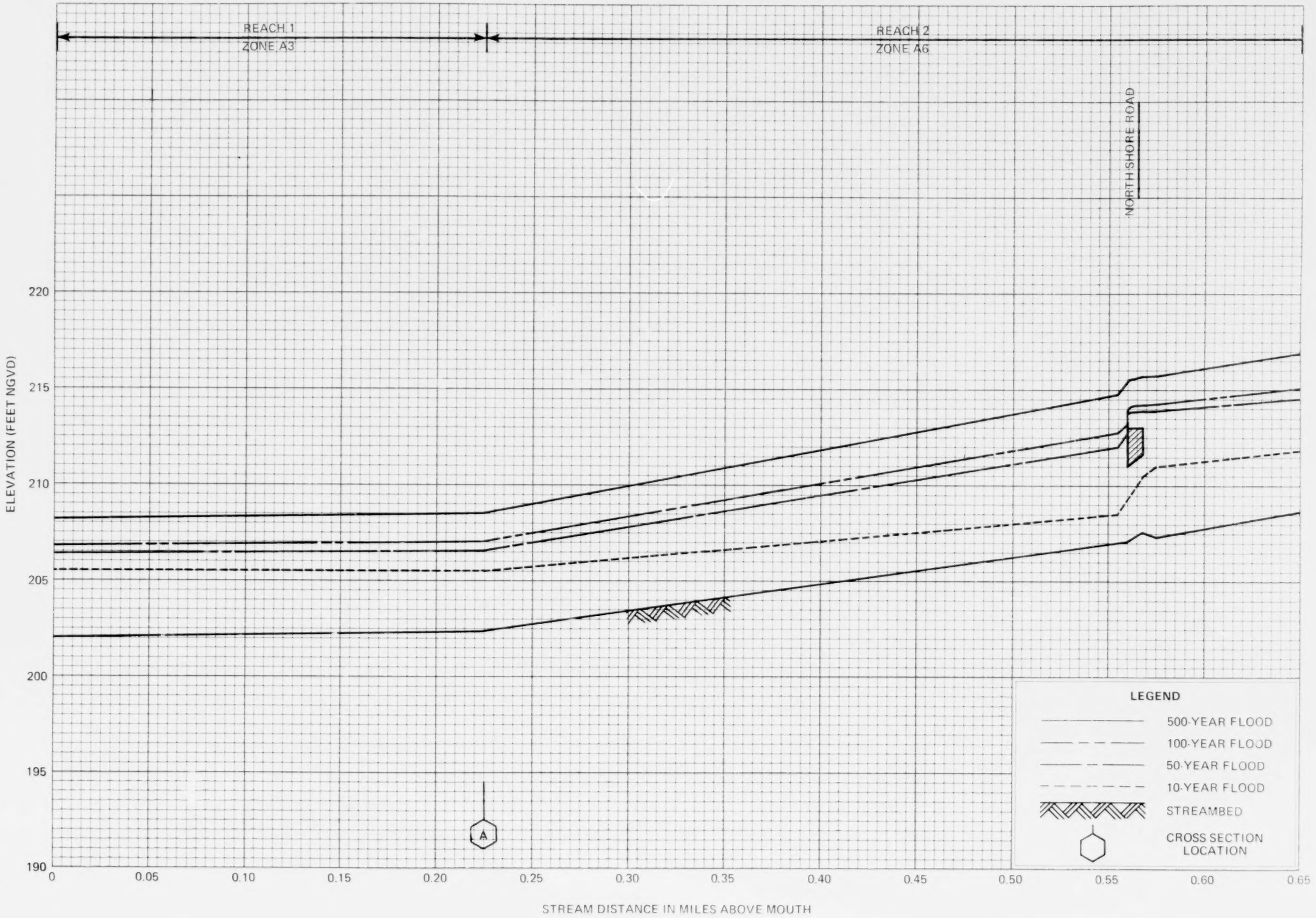
38P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

DREW BROOK



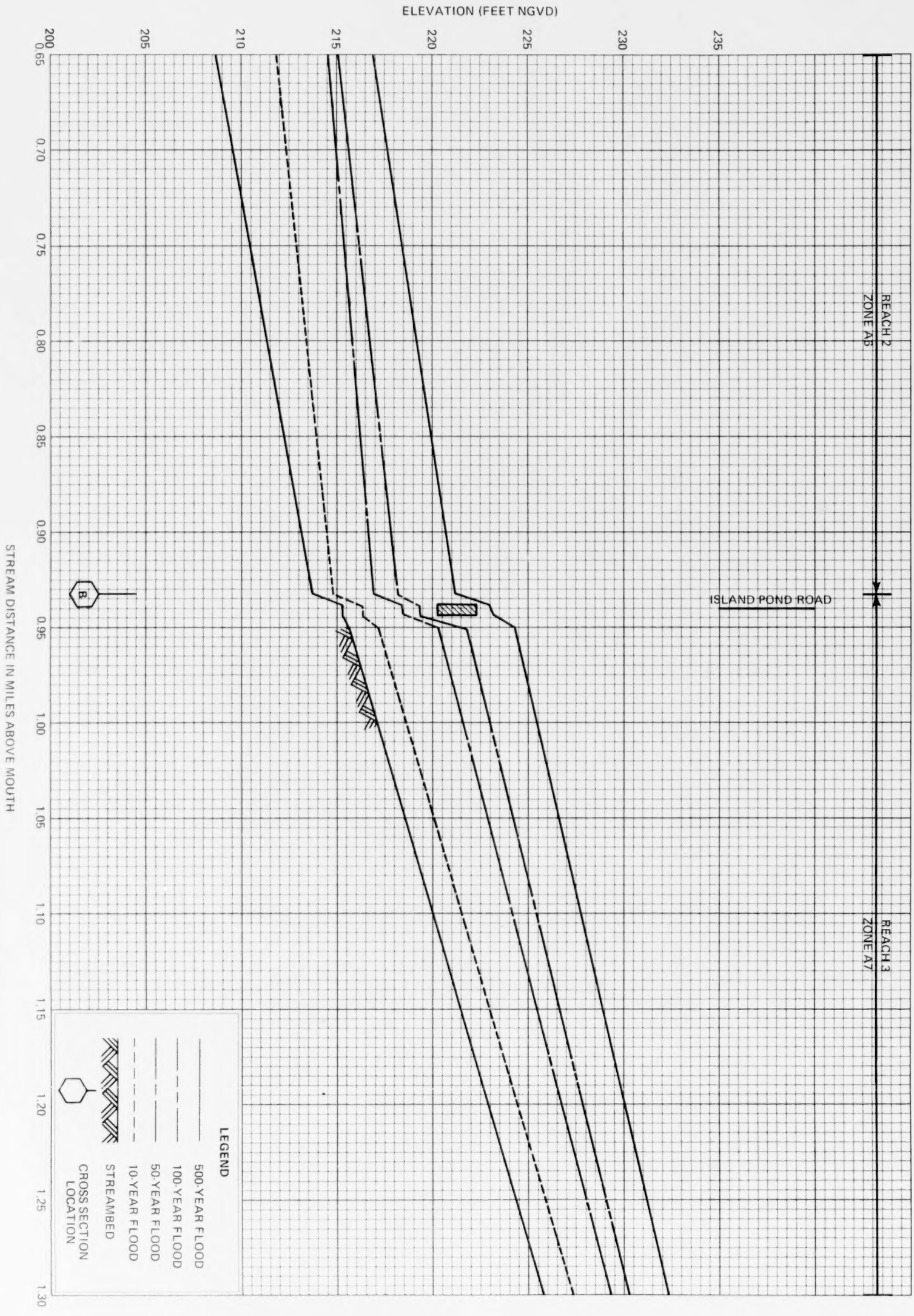
FLOOD PROFILES

TAYLOR BROOK (INCLUDING BALLARD POND)

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

40P



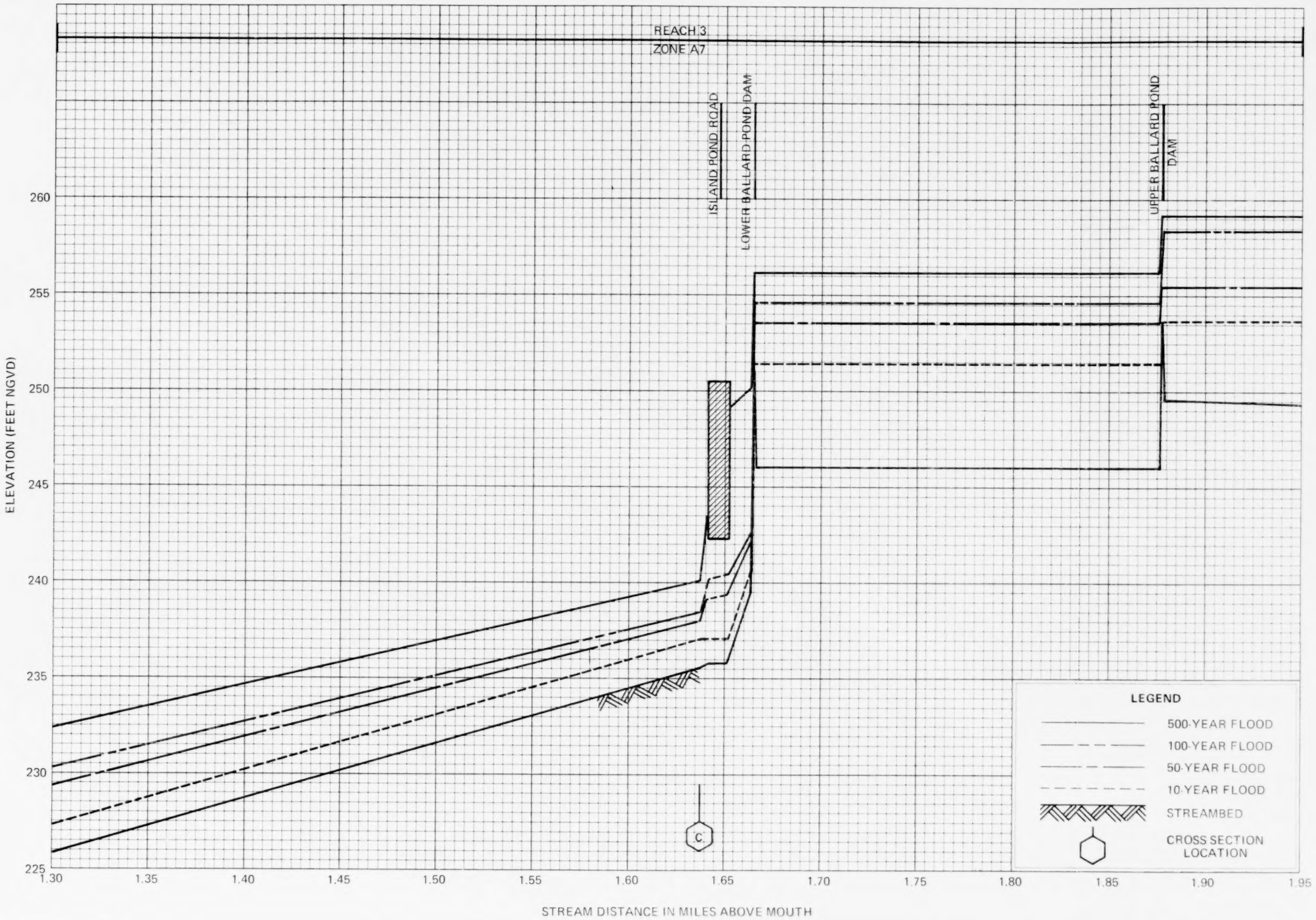
41P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TAYLOR BROOK (INCLUDING BALLARD POND)



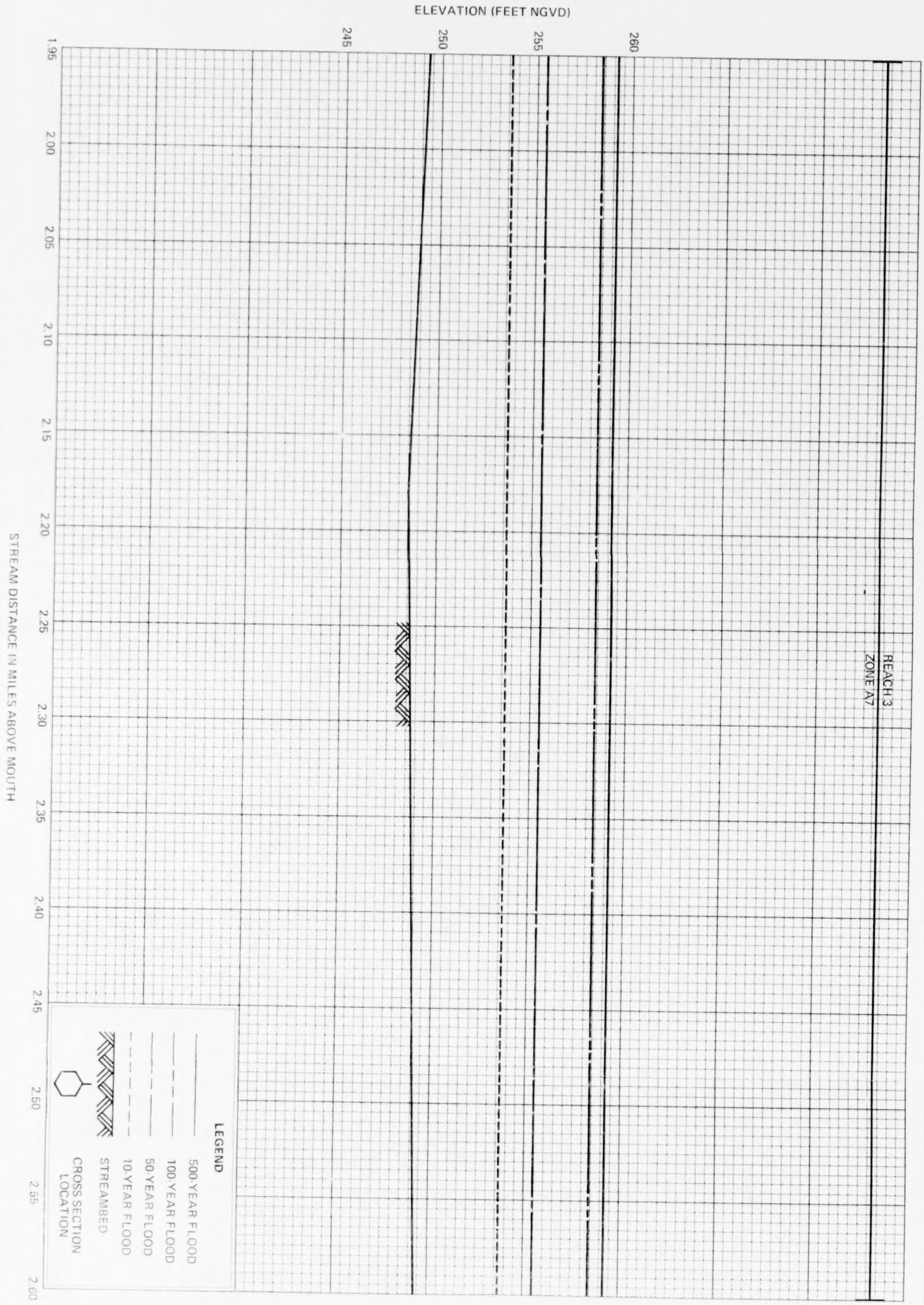
FLOOD PROFILES

TAYLOR BROOK (INCLUDING BALLARD POND)

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

42P



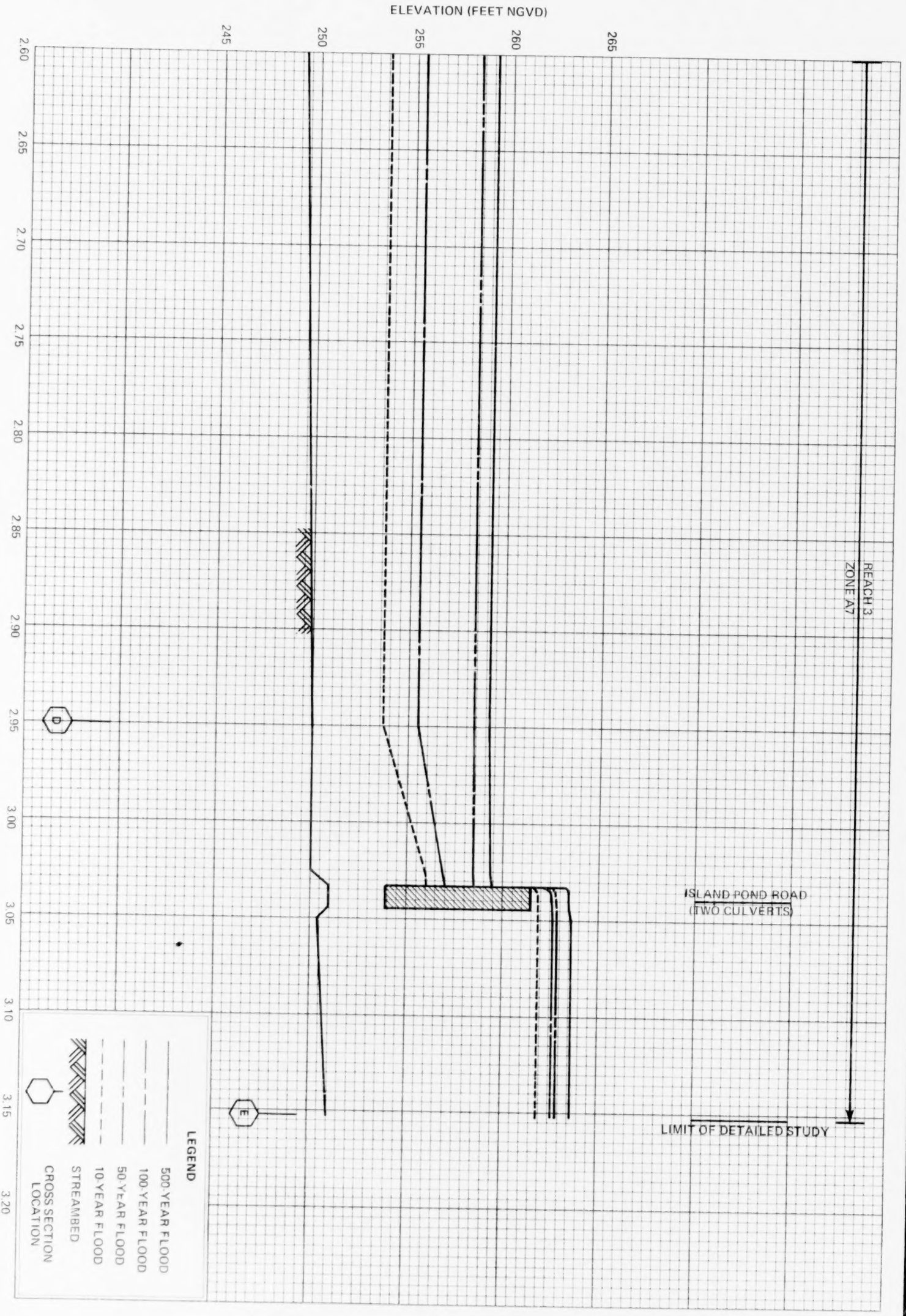
43P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TAYLOR BROOK (INCLUDING BALLARD POND)



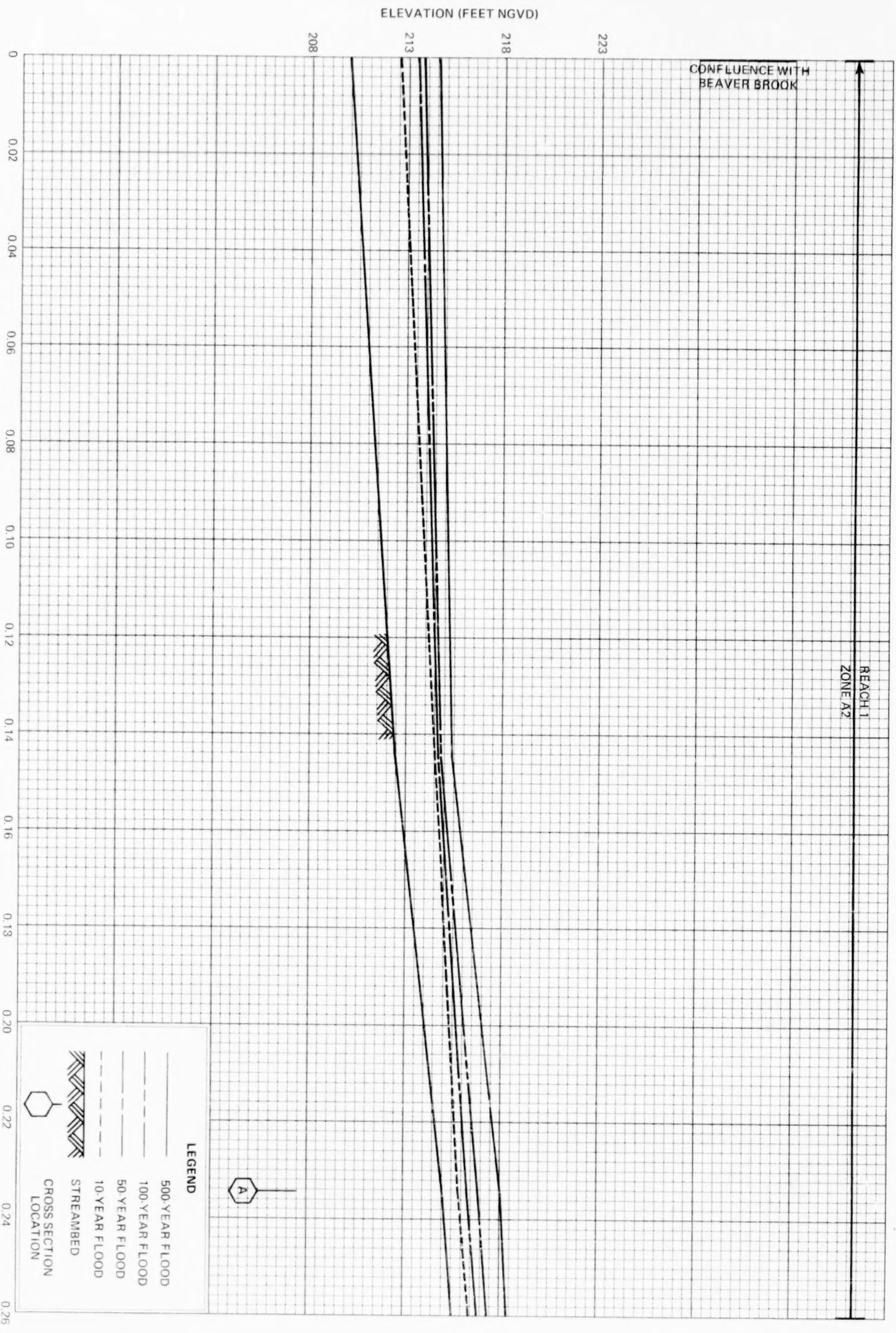
44P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TAYLOR BROOK (INCLUDING BALLARD POND)



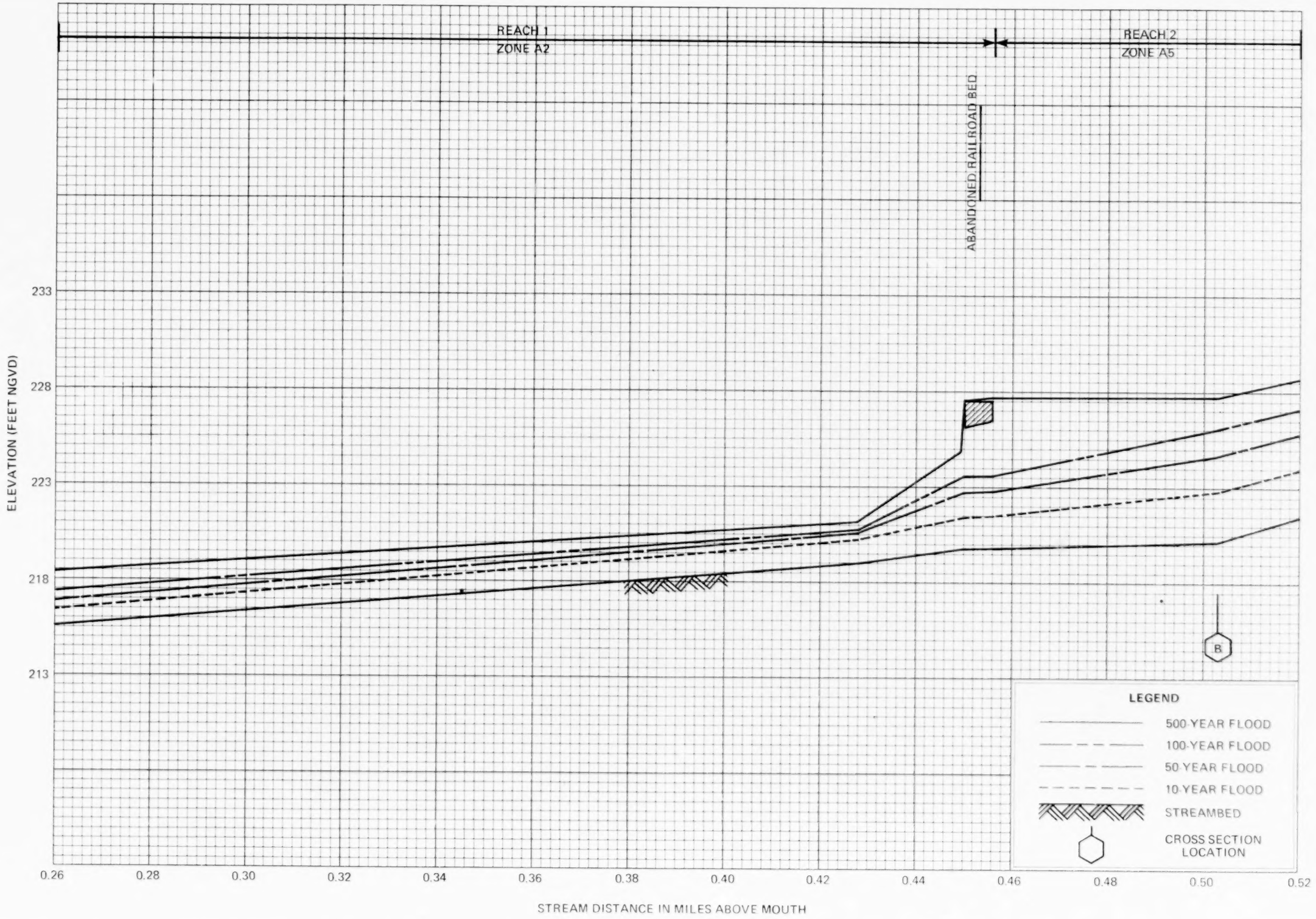
45P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY H



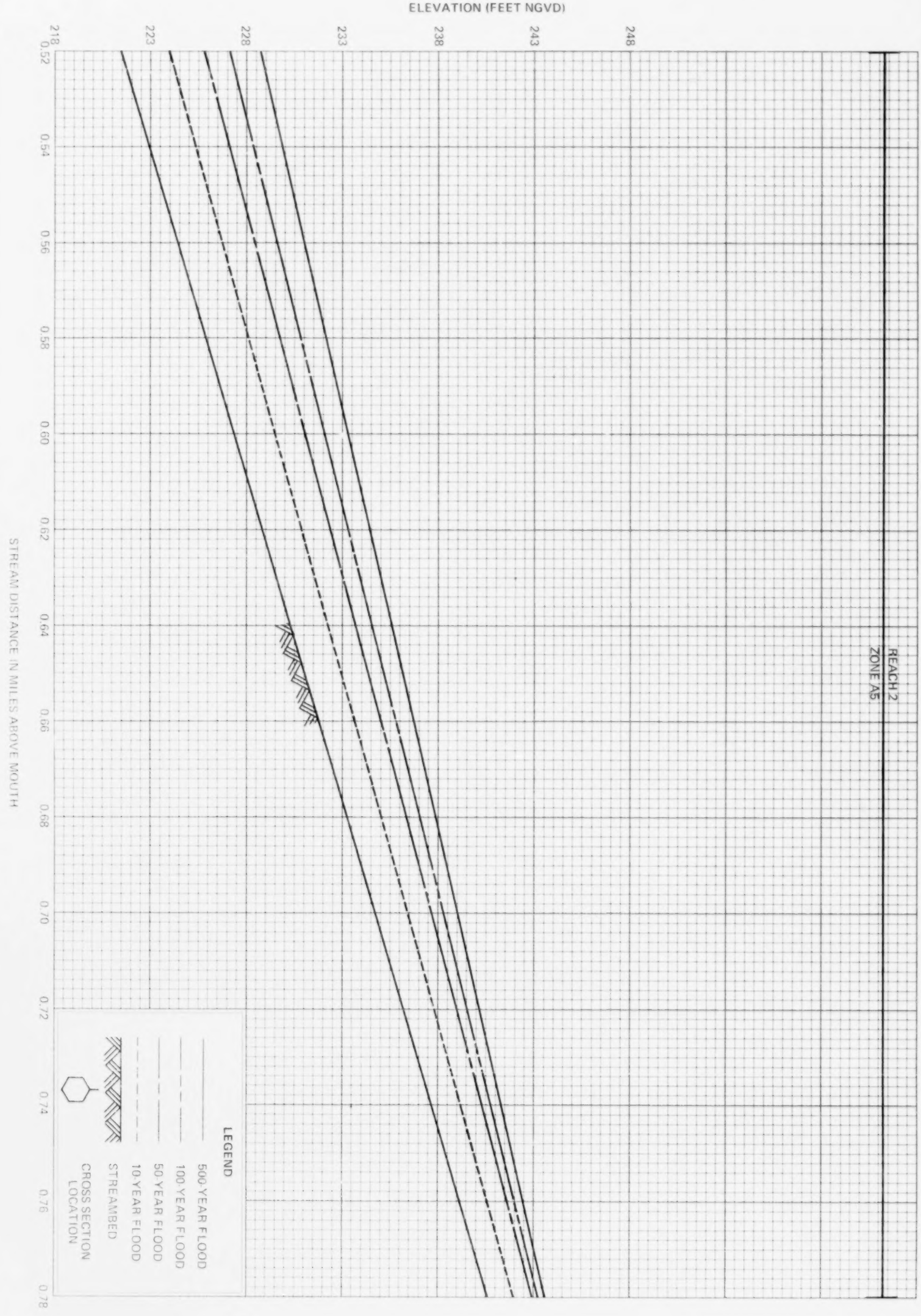
FLOOD PROFILES

TRIBUTARY H

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

46P



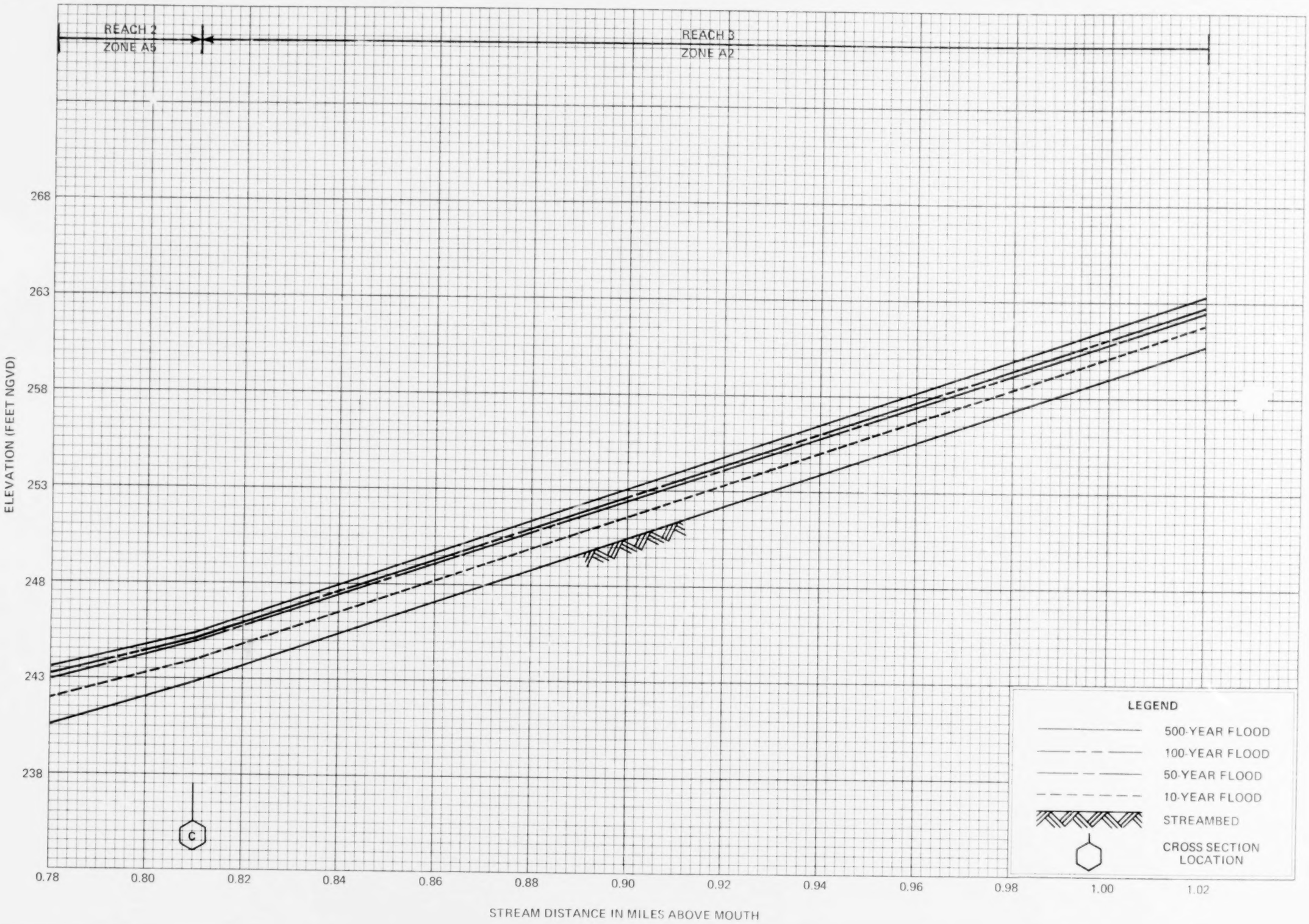
47P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY H



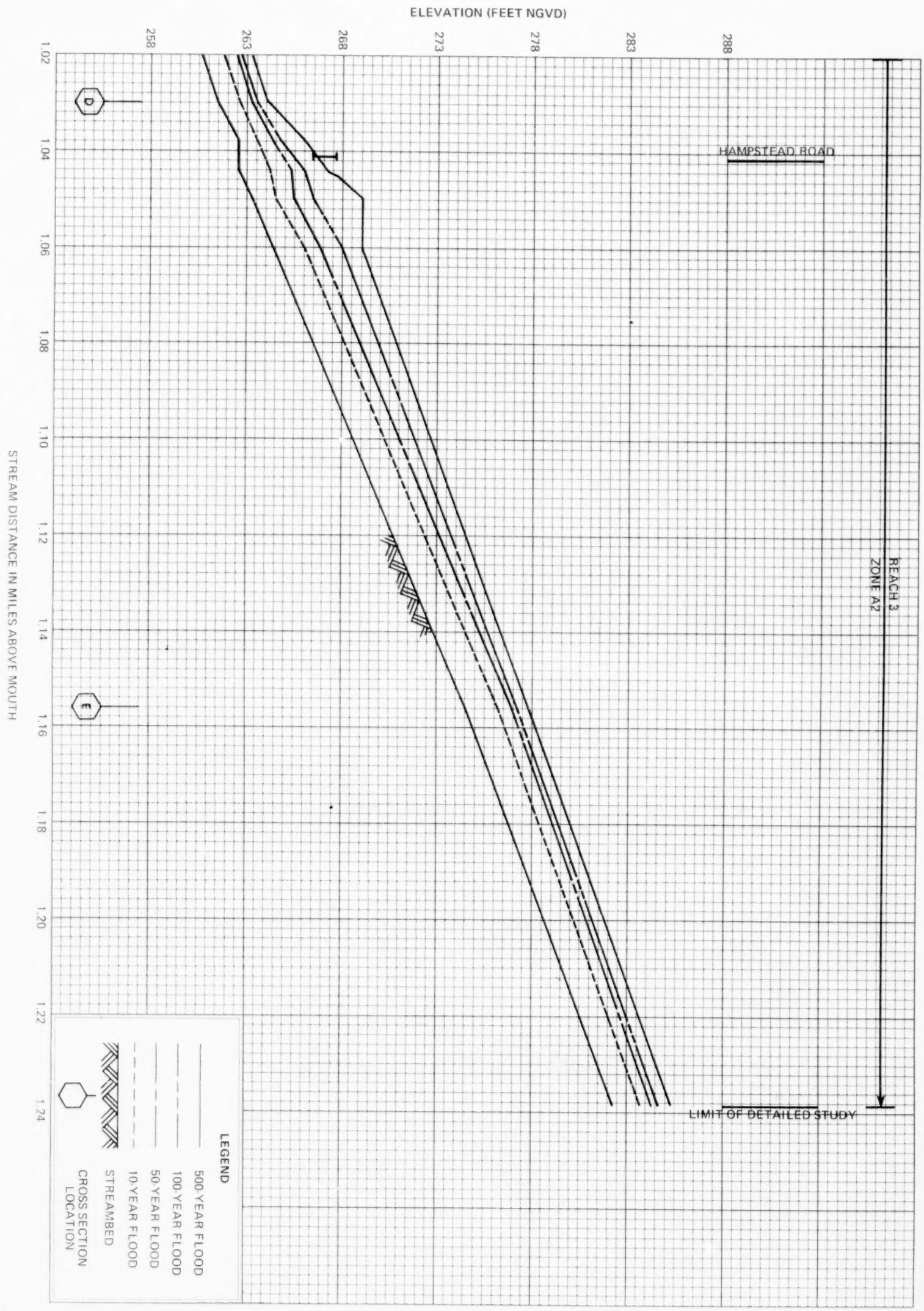
FLOOD PROFILES

TRIBUTARY H

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

48P

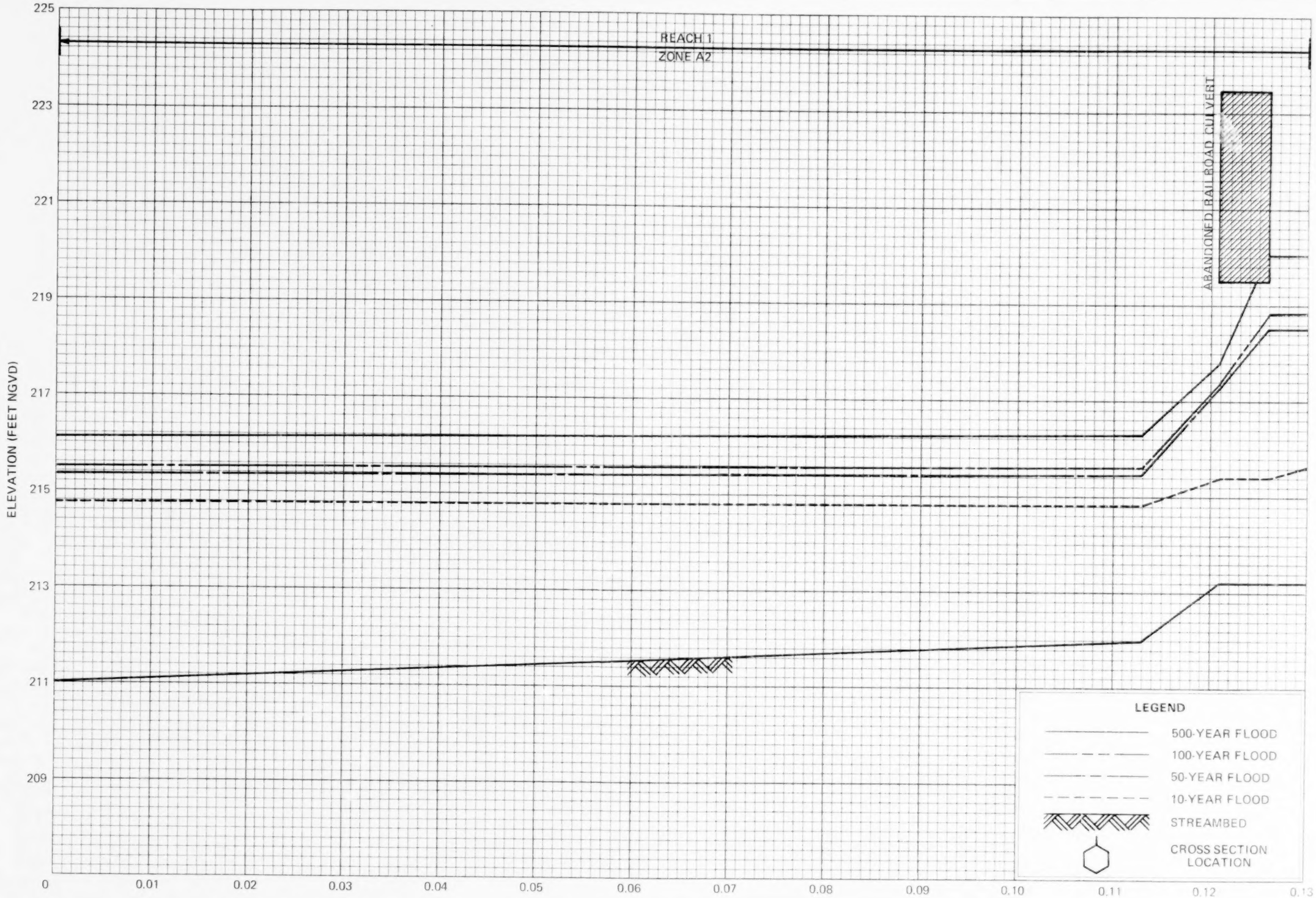


FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

TRIBUTARY H



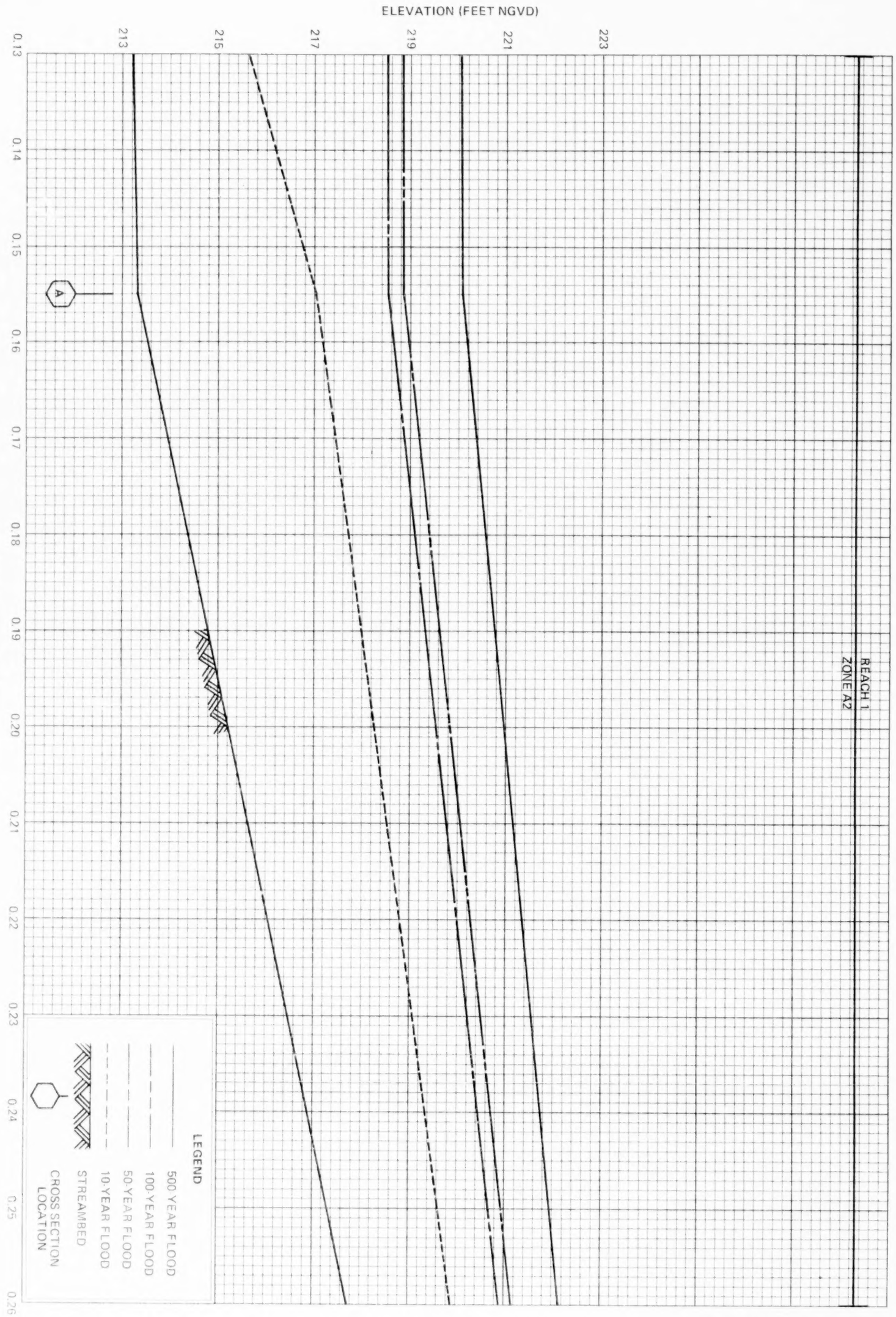
FLOOD PROFILES

CUNNINGHAM BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

50P



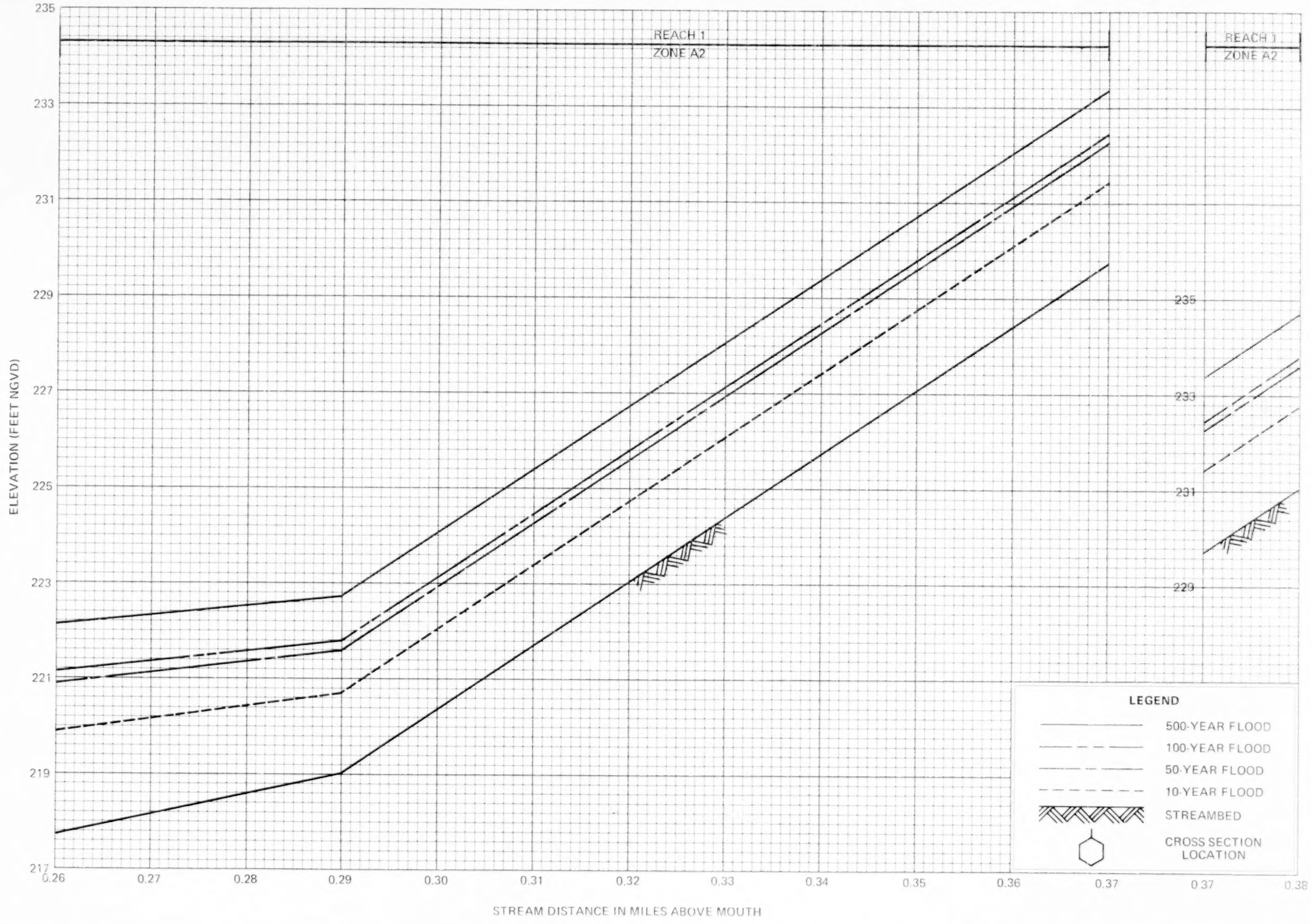
51P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
[ROCKINGHAM CO.]

FLOOD PROFILES

CUNNINGHAM BROOK



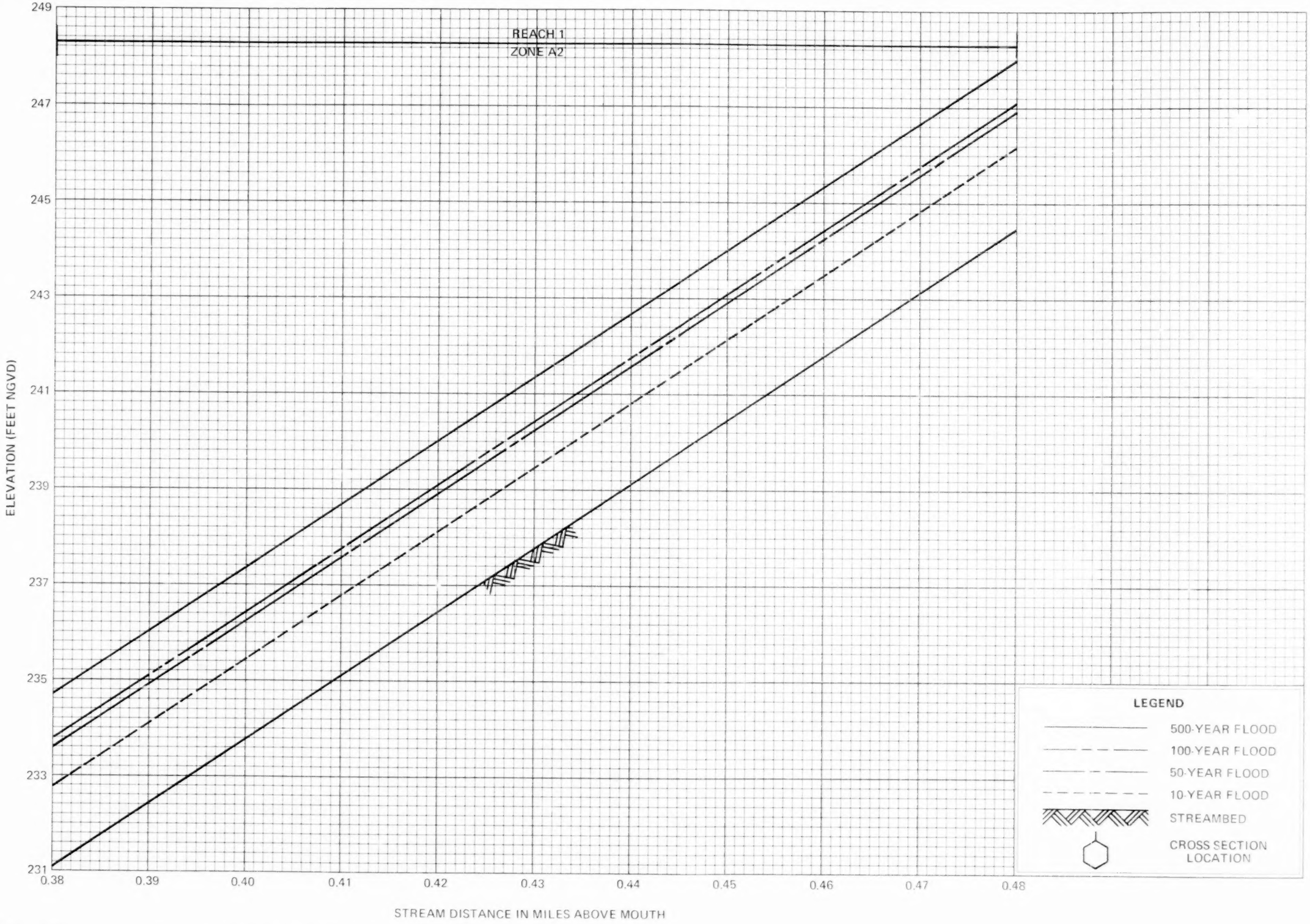
FLOOD PROFILES

CUNNINGHAM BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

52P



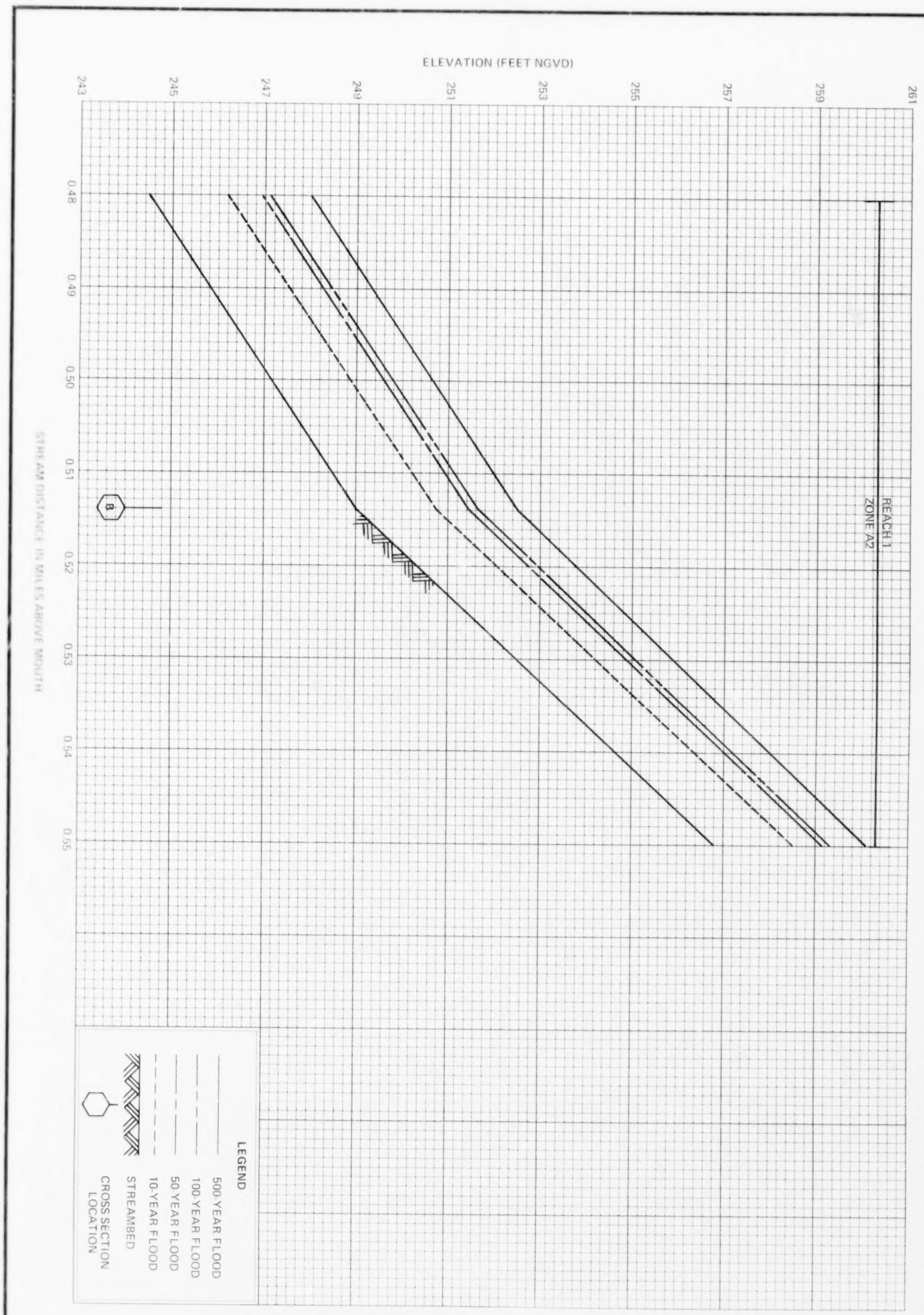
FLOOD PROFILES

CUNNINGHAM BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

53P



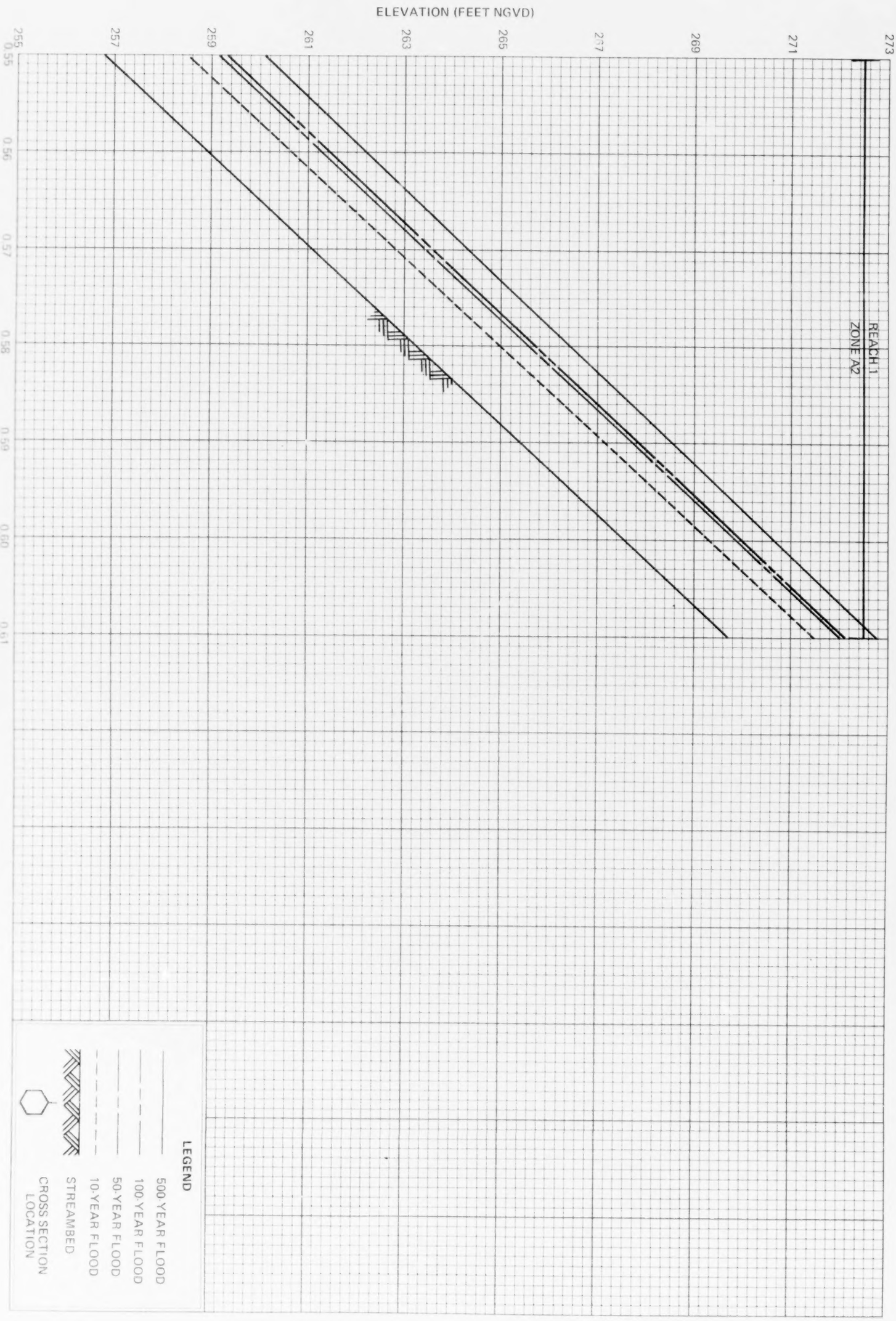
54P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

CUNNINGHAM BROOK



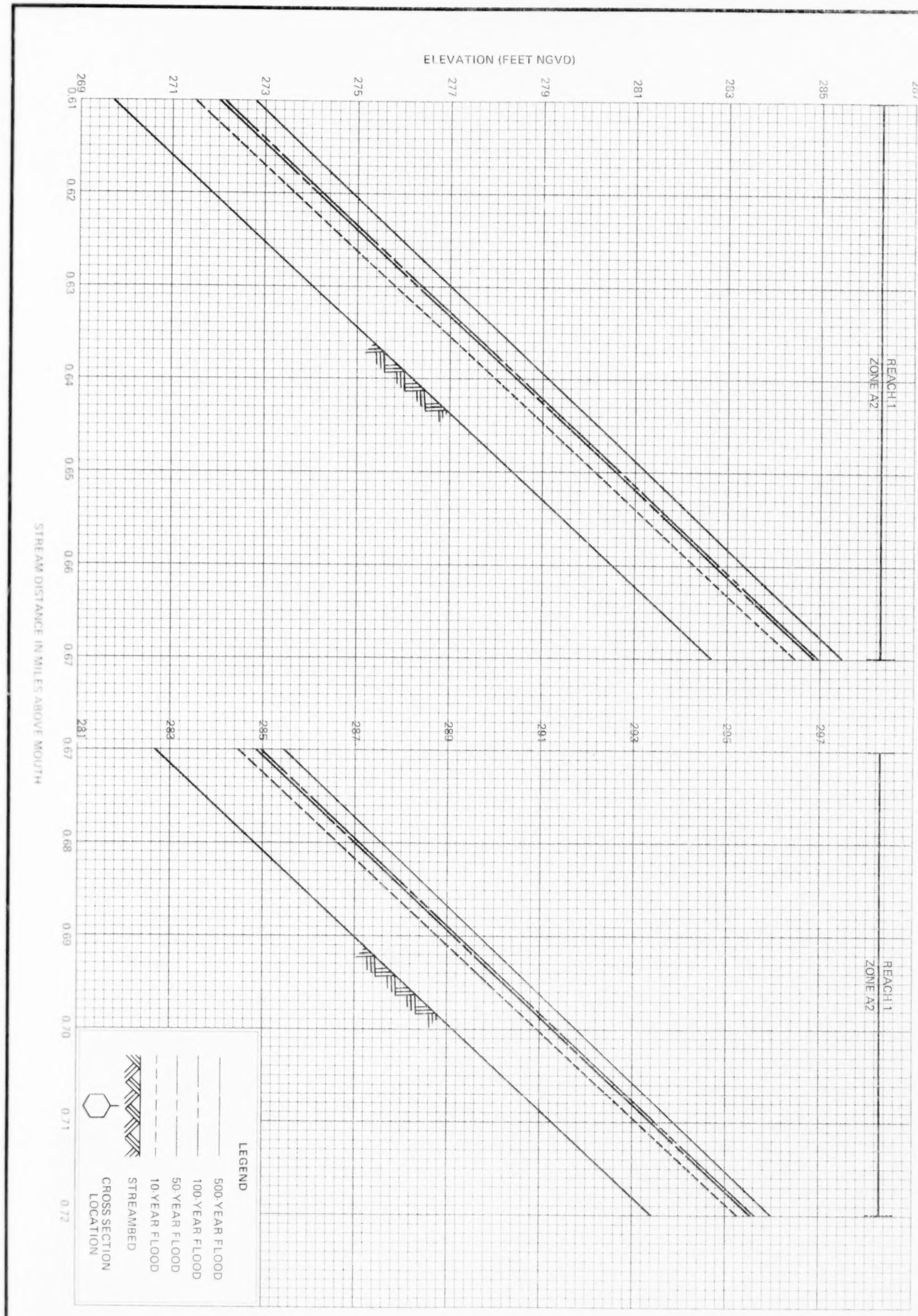
55P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

CUNNINGHAM BROOK



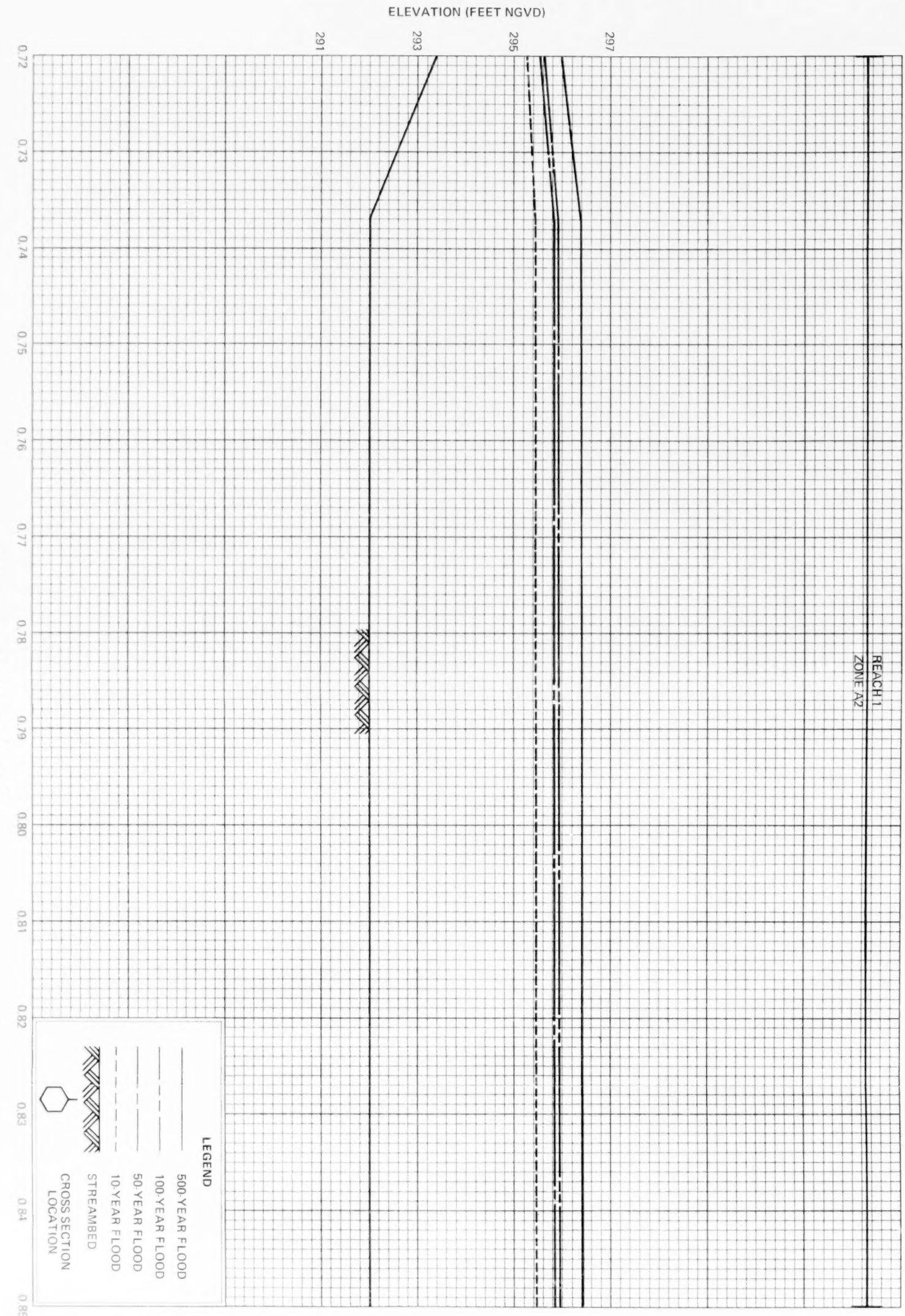
56P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

CUNNINGHAM BROOK



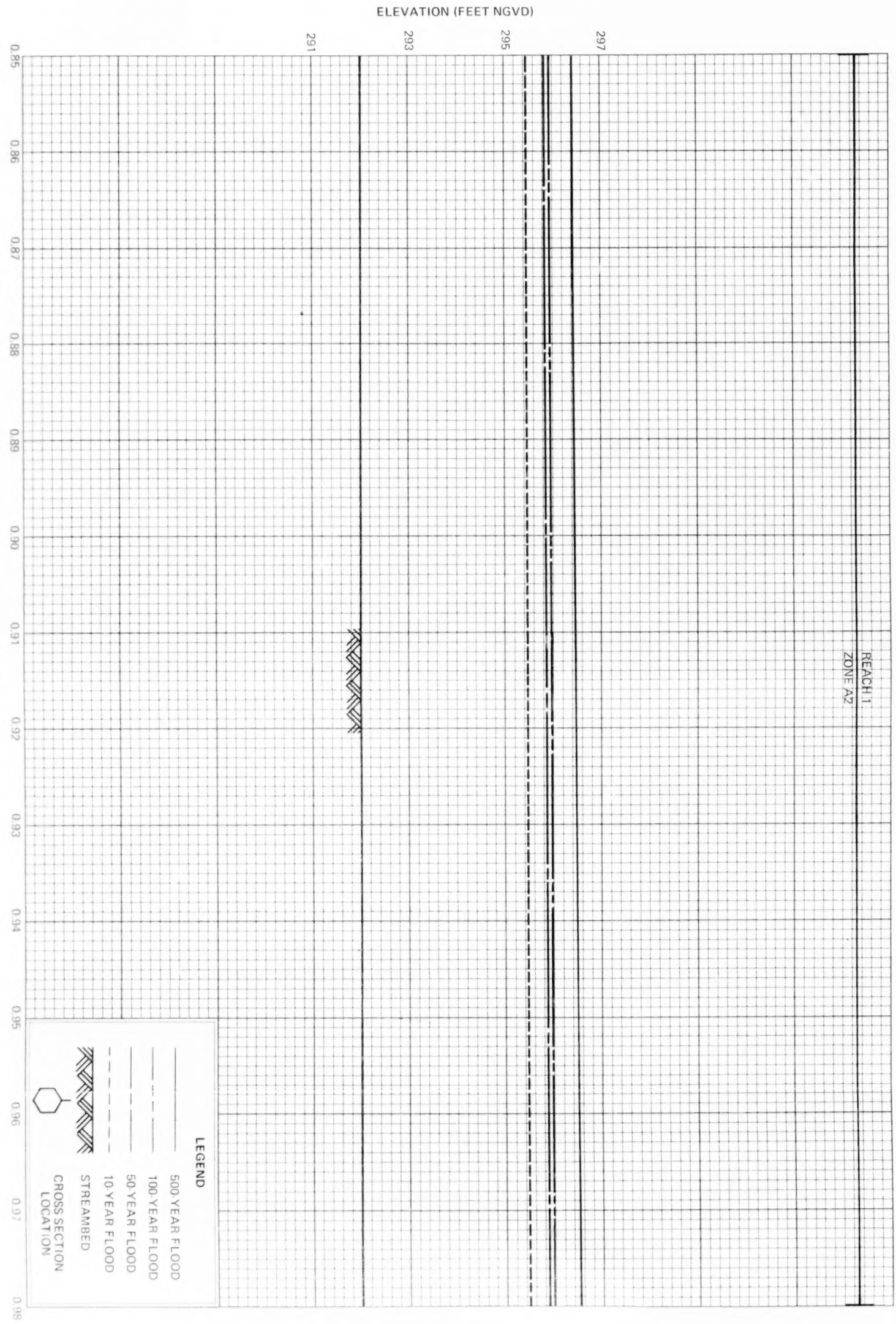
57P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

CUNNINGHAM BROOK



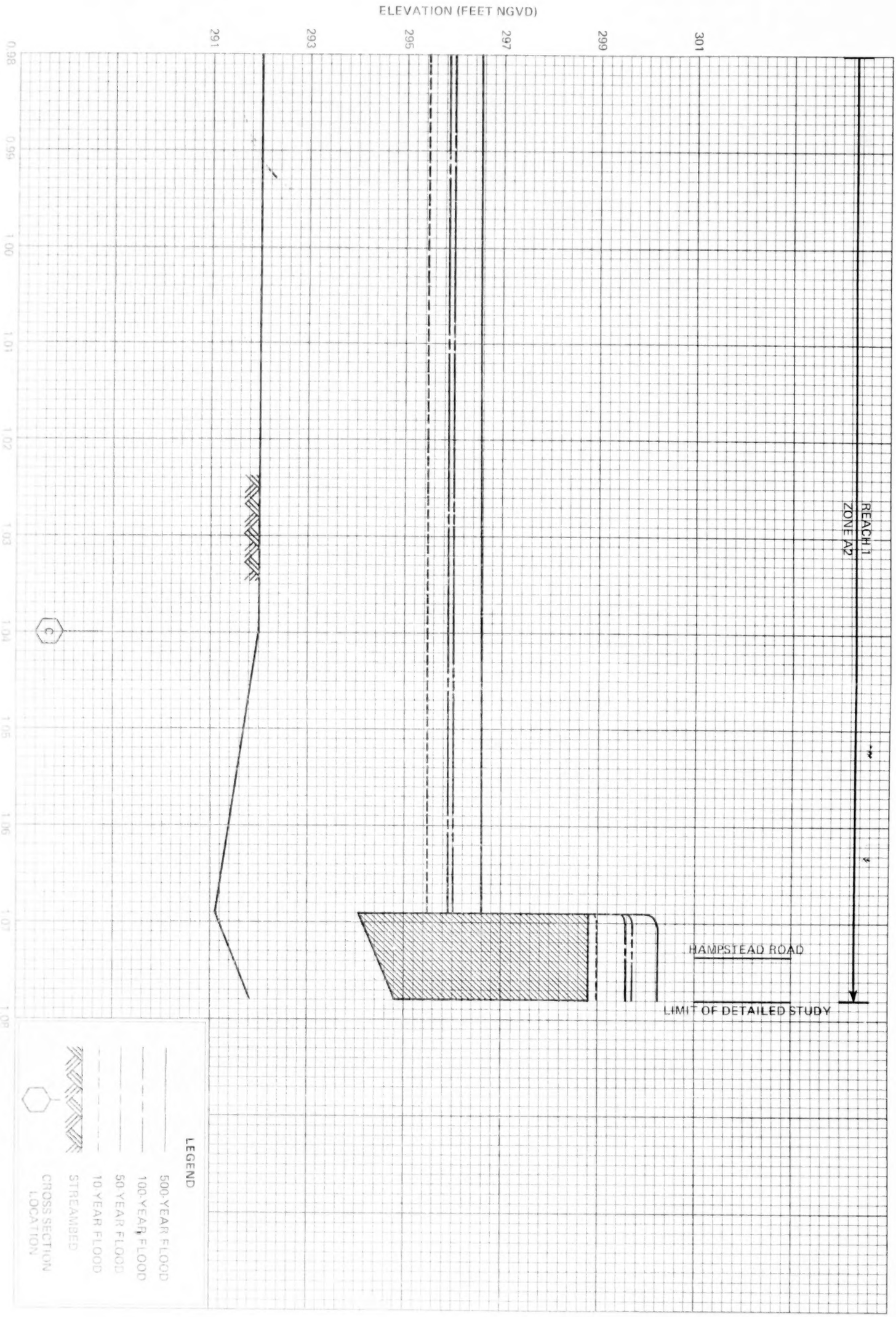
58P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF DERRY, NH
(ROCKINGHAM CO.)

FLOOD PROFILES

CUNNINGHAM BROOK


ELEVATION (FEET NGVD)
291
293
295
297
299
301
STREAM DISTANCE IN MILES ABOVE MOUTH
0.98
0.99
1.00
1.01
1.02
1.03
1.04
1.05
1.06
1.07
1.08
REACH 1
ZONE A2
HAMPSTEAD ROAD
LIMIT OF DETAILED STUDY
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAMBED
CROSS SECTION LOCATION